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OUR ASSOCIATION, HYGIENE, BUSINESS AND GOVERNMENT.

Our association, says the constitution, has for its objects "The development and advancement of public hygiene; the correlation of principles and practice; and the promotion of public hygiene as a distinct profession." In these words a great work is declared, and it seems that probably the foremost duty we have to perform to accomplish these ends is to bring into the public mind a full appreciation of the obvious fact that prevention and not cure is the final aim of medical science.

Science has again and again shown that a very great obstacle to progress is our all too frequent inability to see the obvious.

The fact that right now our practical business men are eager to pay millions for cure, and can with difficulty be induced to spend in comparison an insignificant sum for prevention, is evidence of the correctness of this contention.

The fact is remindful too, of the sometime emphatically uttered principle —"not a cent for tribute, but millions for defense;" but, we are to observe, that in our attitude toward disease and other ills this principal is reversed, for we persistently give millions and millions of tribute to the excelsior stuffed good of cure, when a little spent for defense in the line of prevention would bring great benefits.

OUR PROGRESS.

The progress made by our association has been good; but of course must be better. Only recently we adopted a new constitution, improving the

old one in not a few respects and possibly not in others. At our last meeting, steps were taken which show our motto is onward. Under laws passed in the Havana sessions, the confusion in our treasury has been removed; a full and perfect list of members and subscribers to the journal has been completed; over one hundred new members have been added to our association; over four hundred new subscribers for our journal have been secured, advertisements have been increased by 50 per cent. and at better prices, and the report of laboratory methods from our laboratory section, published at an expenditure of $700, is an asset worth fully $1600, with 400 volumes sold. The details of what is here mentioned, and the details also of other good things done, will appear in the reports of the secretary and treasurer. We certainly wrought well, when the Committee of Seven, in obedience to the resolution of the association, appointed a salaried secretary, a salaried treasurer, and a paid, experienced editor for our journal.

And how fortunate we have been in the matter of the selection of the incumbents of these positions appears more and more evident every day. Now our present needs are those which in the nature of things will *always* be with us in some degree, and to secure them our endeavors must be unceasing. We must have more members to bring in more money, more workers, more brains. Striving for these will certainly secure them in deserved measure in due time.

Our name is the American Public Health Association. Certainly a goodly name. Our objects have been stated in the words of our constitution. Our character and standing are established. We have passed adolescence. Like all other associations, we have seized upon many opportunities and neglected or missed some. We have undoubtedly done those things we ought not have done and we have left undone those things we ought to have done, and there is still much health in us.

That health will manifest itself eventually by our more completely fulfilling our prominent function as an effective leader in the public health movement.

We have heretofore lacked executive force; we need a permanent executive office to insure continuous action between meetings. As has been well said—"the working organization of the association at present is too loosely made up and too cheaply run to be effective." And then too says the same critic—"A potent defect in the existing scheme of organization lies in the fact that as a more or less efficient machine, the association exists for but a few days each year." At our last meeting action was taken toward the removal of some defects. It is now possible to elect members between meetings, and not only for five days in the year. This change has led to a decided increase in membership of the permanent kind. Under the old system, every year the membership was recruited from the region where

we met, but the majority of the recruits joined for a year only, the association was stimulated by the membership fee received, then the new ones dropped out, the process was repeated, and still we languished for lack of members of a kind that work.

I believe we should not longer delay opening wider the entrance door and above place the motto—"Welcome to all who believe." To be a useful active member of our association, it is surely not desirable as the constitution says, to "have been, for a period of three years, in the active professional practice of technical branches of public hygiene; or have been for a period of three years on the executive or technical staffs of governmental departments dealing with phases of public hygiene in the countries represented in this Association." Such requirements should not stand against active membership, but would be proper for membership of sections.

A man who is high in power and position, whose name is known in every household, expressed a wish to belong to an association devoted to raising the public health. This wish was expressed when he had been told of the aims and practical work of our Association. He is a man who wishes to work, to bear his share of the burdens and honors, to vote, and to have free speech upon all and every question. He therefore did not want to be an honorary, or an associate; he desired to be an active member. Our constitution barred him, and his name does not therefore give luster or eclat to our roster. I would say, let any person of good character, who is interested in hygiene, who will pay his annual dues and will attend, be an active member.

I suggest that we simplify markedly the constitution and by-laws in such a way as to admit all who believe.

I would abolish the class of associate members, I would cut out all the hopeless red tape which now surrounds, and sometimes blocks, even the simplest business operation of the association. I would establish a permanent salaried executive secretary. His office would be a clearing house of information on all public health questions, and through this means we could take up definite and practical constructive work.

The obstructive features of our constitution and by-laws could be eliminated speedily, but the building up process upon a right foundation must, perforce, be slow. I do not advocate that we go at this matter with an axe, but on the contrary that it be done carefully and judiciously but with all convenient speed. As a vital first step in the direction of increasing usefulness and influence, of meeting the most important need of the situation, I regard the Journal as the essential factor. It is our orator. The enemies of Greece said, "Give over Demosthenes into our hands and we will cease our warfare against you." But the Greeks kept their orator and kept on fighting and the already great nation became greater. Let us make the Journal great by making it possible to do a great work, and then the parent

will see the rapid development and advancement of public hygiene, the correlation of principals and practice, and the promotion of public hygiene as a distinct profession. But enough of this; and now health, more health, is the slogan.

WHAT IS HEALTH?

This is the title a minister suggested to a hygienist whom he invited to occupy his pulpit. It is a big text. An authoritative definition might be productive of good to the public health cause. Perhaps careful examination would disclose that it would be wise for this association to formulate a definition and give it to the lay press. I think it would be gladly received and widely published. It would make clear a matter that is now hazy even in some minds which have dabbled more or less in hygiene. We all have read Dr. Crumbine's definition, which is excellent indeed, and I dare present it because of its excellence and because its review may lead to the adoption of my suggestion.

"Health" he says, "is a state of physical, mental and moral equilibrium—a normal functionating of body, mind and soul. It is the state when work is a pleasure, when the world looks good and beautiful, and the battle of life seems worth while. Health is the antithesis of disease, degeneracy, and crime.

"The laws of health are as inexorable as the law of gravitation, as exacting as eternal justice, as relentless as fate, and their violation is the beginning and cause of all disease, suffering, and sin.

"Health is the most desired of earthly blessings. When finally lost it cannot be purchased by uncounted millions, restored by the alienist, or returned by the pulpit.

"Health is that state of happiness, faith and love whose prototype was the first man—Adam; whose ideal is the Christ."

This is a splendid sermon, and it contains suggestions for several good sermons on health. I wish our association would adopt this, if consent can be gained, or formulate another, and send it forth to the world. It would comport fully with our dignity and the objects of our being, and would start something in the line of "the development and advancement of public hygiene."

WHAT IS HYGIENE?

Hygiene is a great science. It deals with the attainment and preservation of health. Solomon was asked "What shall I give thee,"—and he chose wisdom. But not enough of the gift was bestowed to enable him to preserve his health, as is evidenced by his many pessimistic lucubrations. He might well have asked for a healthy mind in a healthy body and a knowledge of hygiene sufficient to preserve both, and this would have been widsom.

Hygiene has in it the promise of more good for both individuals and the human race than any other science. Its first great idea is—let us not be sick, for disease is ignorance and health is normal, It must answer the questions—from whence comes sickness and disease? And this it has done to a good degree. Second, it must answer—what is necessary to prevent sickness and disease? And this too it has done to a good degree.

The foolish, weak idea that unwellness and disease are devils or evil entities which somehow find entrance into our bodies prevails, even now, to not an inconsiderable degree. And, marvelous to relate, there arose only yesterday a cult which says there is no sickness, no disease, no pain. This declaration is made too in the presence of plainly apparent physical pain and suffering and even in the presence of a case of severe loathesome smallpox, thus discovering that the said cult is in pitiable and hopeless estrangement from common sense. And again it proves that the mentally sick or mentally defective class is larger than was previously believed.

For centuries man has tried to turn back, or at least to control disease by cure; yet, knowing since the days of the creation of the mythologic Hygica, that prevention was the rational course. At no period in history has this truth been more forcibly shown than in the last quarter century by the triumph of hygiene over yellow fever. In connection with that disease therapeutics bore no burden. Not a single medicine in all materia medica had the least effect. Prevention and it alone, has abolished yellow fever. And this broad application of hygiene to the masses brings wholesale health. And it should be noted that, as with typhoid fever, the prevention of one case prevents three cases of other diseases. Business has profited greatly by this triumph of hygiene over yellow fever, and government and morals and all other elements of civilization also.

That health is the basis of all wealth, power and happiness is plain to any one. That business and government has for so long neglected to place hygiene in the front of all practical agencies for good, simply declares that those in charge of business and government have not yet risen to a full understanding of the situation they are trying to control. John Fiske remarked, "It takes a thousand years to raise the human family a single notch." In view of the tardiness of business men and of those in control of government to grasp the business and governmental importance of hygiene, it would seem that Fiske much underestimates the time. Münsterburg said, "Hygiene can prevent more crime than any law." Disraeli, the practical statesman and empire builder, said, "The care of the public health is the first duty of the statesman." A bill for a law intended to make practical the government's part in the care of the public health, provided as follows: "It shall be the duty of the bureau of health to collect and disseminate information relating to the public health."

This was pronounced to be a deadly provision by an orator in the Senate

of the United States. He said, "This would be planting the seeds of disease and killing more innocent and unsuspecting people than drugs ever saved." Think of it; this in the United States Senate in the 20th century and by a man who can read and write, saying that disseminating *information* concerning the public health would be planting the *seeds* of disease. This is calculated to make one despair of our nation ever being able to take kindly care of all of its defectives.

Not until the science of medicine had purged from the human mind the idea that insanity was possession of the devil, and showed it was a physical ill, did mankind come to treat the insane in kindness, patience and charity. The kindness, charity and patience were in the great human heart all the time, but the human mind was charged with error and this stifled the heart's expression. Obviously, we must rise out of the patent medicine stage of ignorance and out of any so-called religious beliefs which are "loaded with a perishable freight of over-ripe theology," before hygiene can do its beneficent work for mankind.

HYGIENE AND BUSINESS.

Sickness, ill health, disease, weakness and early death cannot build up business. It probably would not be amiss to say that if not a majority, certainly a good proportion of business failures are due to ill health or disease, unnecessarily, yes, foolishly acquired. "I am sick to-day and unfit for business" said the manager of a large business concern. Another said "I notice I am very liable to make mistakes in my business when I have a cold or a headache or have even a slight indigestion." Plainly, when a man suffers from typhoid fever or pneumonia or syphilis, he is absolutely unfit for business or indeed any of the affairs of life. He is then a charge, a burden, and a threat against business, against his family, his friends, and the state. A science which would prevent communicable diseases, and which can teach how not to have the minor ills (which in the aggregate do more harm than infectious diseases) is of great business importance, and such a science is hygiene. When an epidemic of smallpox or diphtheria appears in a community, business is hurt, and the business man demands that the health officer shall put it out. The business man formerly thought the way to get rid of epidemics was to deny their existence or to stifle all information of them, thus showing they believed ignorance to be a force for good, and this too, when ignorance is the only sin. But now he has emerged somewhat from this ignorance, and appreciates to a greater degree how hygiene can help business. There is no money in sickness except for the doctor and druggist, and they frequently spend all they can make from sickness in seeking cure for their own sickness. Three quarters of a century ago Horace Mann the well-known educator, when told one morning

he did not look well, said, "Yes I am ashamed to say I am not well." We did not know then as fully as now, the causes and needlessness of sickness, but Professor Mann had grasped the central idea of the science of hygiene.

If an archangel, with credentials to prove his power, were to come to Washington, and during a lull in the political hubbub were to tell us that for $100,000,000 he would *cure* all the diseases and would leave the medicine or its formula to cure them as fast as they appeared after he was gone, we would raise the $100,000,000 in no time. Congress, all state legislatures, boards of trade, commercial clubs, bankers' organizations, would all tremble with activity in their eagerness to produce the hundred millions. And what a funny sight it would be! Then the regulars, and the irregulars, and the quacks, and the mind curers, and the faith curers, and the advocates of all pathies, of all cults, and the business men, ministers, teachers, one and all, would view this proposition as a practical one, and in spite of the fact that it is contrary to the fundamental principles governing the situation. Now, right in the front of us and always present stands an archangel fully credentialed, who is ready to teach us how to drive ill health, disease, imbecility, insanity, crime and pauperism from the earth. His name is *Hygiene*. He does not ask $100,000,000 for his discovery, he will give it to us. And yet, in the presence of this heavenly offer we stand stupid, like pigs before pearls. The proposition of the archangel Hygiene is rational, accords with nature's laws, and is the biggest and most practical business proposition before the world today.

To hope to overcome disease by cure is simply ridiculous. To try to sweep back the sea would be a more hopeful task. That prevention is practical, rational, business-like, scientific, is plain even to a child, yet we continue to depend upon the irrational, impractical, unbusiness-like, unscientific idea of cure to relieve the world of sickness.

HEALTH AND HEREDITY.

Race hygiene precedes individual hygiene in classification and in importance. Nation hygiene, as when a nation rises and puts out yellow fever, also precedes individual, that is, personal hygiene.

Race hygiene is primarily concerned with the great subject of heredity. Researches in heredity have let into many human problems a flood of light which was not enjoyed by those living in the first half of the last century. A strong thinker guided by this light said, "At the moment of conception the gate of gifts is closed." In fact, it is closed long before. It is personality which arises when the ovum and sperm cells blend together.

One servant may inherit one talent, another two and still another three, four or five. But these talents were given them; talents are not acquired. The person who is given but one talent will invariably hide it in a napkin

and it will be taken away altogether, while he who is given several, places them at usury and they produce a hundredfold. And so it is—all that a person may be, his entire physical and mental potencies, come with him from the womb.

> "His life was gentle; and the *elements*
> So mixed in him that Nature might stand up,
> And say to all the world, *This was a man.*"

Our only privilege is to develop the heritage we have received, the elements transmitted from our parents, and this is our life long task.

"Recent studies in heredity" says Davenport "make it probable that every *disease*, every peculiarity of form, structure and conduct of human beings, is determined in part by an hereditary factor." Continuing he says: "The nervous history of every child is thus, within limits, predetermined at the moment of conception. From this point of view the germ plasm carried by the parents becomes of increased importance. The family physician, after becoming cognizant of a contemplated marriage which must lead to nervous and weak offspring, should take steps to prevent its consummation. If the rules of professional secrecy regarding matters of importance to progeny work against social progress, they are in so far immoral. The physician must take an active part in race hygiene, or he may be replaced in this capacity by the rise of a new profession."

In the act entitled, "In the Land of the Unborn," in the play of "The Blue Bird," Maeterlinck, in the manner of a genius, shows he has given thought to the great subject of heredity. In this act the curtain rises on a stage well filled with little children, covered with filmy white veils from their heads to their naked knees. In the distance is the sea of time with the rock of ages in the foreground. A white barge appears bearing Father Time with flowing white hair and beard and scythe. The barge touches the rock and Father Time steps out, and the unborn rush to meet him supplicating to be born. He is Time, he bears no bowels of compassion, and he gives not the slightest ear to the cry of the souls before him; he utterly ignores their pleas and supplications. "Ha! you all wish to be born," he says. All rush toward him with uplifted hands and pleading mien. All carry small baskets. He waves back the first two. "No, not you; you must wait ten years." They fall back. Two others present themselves. "Yes," he says, "its your turn, get in the barge." Now two others come forward. He eyes them severely and says, "Yes, it is your turn too; but hold"! (he looks in their baskets and asks) "have you there the diseases you are to suffer from?" They nod their answer and he passes them on.

It is further noted that Father Time makes no requests; he moves with brutal air and he commands. He looks over the heads of those near to him

and pointing to a little boy says, "You come; you are an engineer, mankind needs you." No others are called for.

Undoubtedly there are those who will say, Davenport and Maeterlinck have gone too far, they are extreme. Be that as it may, it is still true. Time goes relentlessly on, generations appear and disappear. Chinese continue to be born of Chinese, negroes of negroes; figs do not come from thistles; blue eyed individuals are born of blue eyed parents; those who break easily under the ordinary strain and stress of life are from a line of ancestors like them, and those who reach old age without serious sickness and without disease and retain their faculties, have in them the blood of those of like accomplishment.

A mere child for the first time saw his new born sister. "What's that? he sharply asked. "It's your new born little sister" was the reply. "It looks like it" remarked the youngster and ran away to play. Whether or not it is true that "*every disease* is determined in part by an hereditary factor" I do not positively know, but I can say,—it looks like it.

THE MICROBE AND HEREDITY.

For three decades the microbe has held the center of the hygienic stage. The transmissible diseases have been wholly accounted for by and through it; but now a new science appears called eugenics, and it declares that not only every peculiarity of form, structure and conduct are determined in part by heredity, but *every disease* as well. However, this in no degree combats or contra-indicates the work of disease prevention, for no matter what the susceptibility may be, external causes have their effect, Besides, if a susceptibility to certain diseases is inherited, then those who bear it in their germ plasm should not become parents if disease is to be abolished.

Our free public school system is based upon the idea that education (nurture) is the greatest controlling force in life. "*We must educate, we must educate, or we perish,*" was the refrain of the orators, and they were right. Yet, it seemed at that time not realized that we educate because we have evolved to a plane where we demand education. We did not then know that acquired characters are not transmitted, and that the reproductive cells are, in a sense, parasitic to our bodies, and quite unaffected by external influences. We had long been told that no one by taking thought could add to his stature, but we had not grasped its full import, for we firmly held that education would drive hence quite all of society's ills. By it we expected to mend defective minds, not knowing that minds and their possibilities, like hearts and their possibilities, are determined at conception. Now we know where the trouble lies with defaulting cashiers, who are not lacking in education and moral training, some of them having been teachers of morals and religion, figuring prominently as Sunday school workers.

They are born defectives, having inherited a defective moral nature.

They have proceeded from a line tainted with the same defect. They did not inherit moral stamina sufficient to enable them to withstand the temptations before which they fell. Powerful and fierce indeed is that environment which can make a thief out of a man of moral inheritance. When needing sorely the bare necessities of life, when feeling the biting pangs of hunger, Lincoln did not falter in choosing the course of honesty. And we cannot conceive it possible for such a character to steal money to gratify the desire to splurge in society. Surely it is the boon of boons to be well born.

WHERE HEREDITY BEGINS.

It is true that whatever is inherited, be it good or bad, mental, moral or physical, has its beginning at some definite arbitrary time. This is when conception occurs, for then, as has been said, the "gate of gifts is closed."

Chromatin is the one constituent contributed in probably equal quantity by both parents, and being constrained to accept this as fact, then there may be, equally and interchangeably, inheritance of features peculiar to either parental stock. We are also constrained to conclude that the qualities inherited are contained in and carried by the nuclear material we call chromatin.

Infectious diseases are caused by the invasion of pathogenic organisms, but many considerations force the conclusions they cannot and do not invade the germ plasm; and even if they could and did and their particular disease produced in the child, still that disease could not be said to have been inherited, for the disease germ in such instance would not be a part of but would be a parasite upon the germ plasm. True, the result is the same whether or not this is inheritance; but the distinction is true, and it is an understanding of the truth that we must have.

In studying this matter we recognize first, the parental properties transmitted to offspring, and this includes all forebears for all generations; and second, we recognize certain attributes which may be ascribed to the bio-chemical interaction of the two parental germ plasms. That such action exists seems most reasonable, for otherwise, what prevents all the offspring of the same parents from being identical in all physical, mental and moral attributes?

WHAT IS INHERITED?

It is of common observation that some families are susceptible to certain infections. This is especially observed in connection with tuberculosis. Every one experienced in the treatment of this disease knows that in certain patients, even in the true incipiency of the attack, all efforts fail to check the progress of the processes. Opposing this state we find families

which show marked immunity against certain or all infectious diseases. Even in the same family the different individuals not infrequently show a marked difference in susceptibility. An immunity against disease in certain animal stocks has long been observed. A farmer in Indiana with much pride showed me an enormous boar. "There is no runt in the litters sired by that animal," he said; "and further, his pigs don't get sick." "You believe in breeding strong stock?" I said. "I certainly do," he replied, "for what is the use in having animals which even under good conditions won't grow as we want them to and are forever getting sick and dying?"

It is well known that Hereford cattle are rarely affected with tuberculosis, while the Jerseys are exceedingly liable to it. This has been explained upon the ground that the first named breed is more recently from the ranges, where pure air, "the enemy of consumption," is most abundant. That the Jerseys have long been confined in houses and thus subjected to bad air with its consequent ill effects. This is not satisfactory. It would not, for a moment, be offered as an explanation of those physical features by which we know the Herefords from the Jerseys, nor in explanation of the marked differences which exist in milk and butter producing capacity.

Obviously, heredity is the force which produces these differences and it also produces the greater resistance to the tubercle germ which the Hereford stock enjoys. The frog inherits a blood plasma that is inimical to the anthrax bacillus and the cholera vibrio. The first known blood resistance to disease was that of the fowl to anthrax. It has been shown that it is difficult indeed to overpower a fowl with anthrax bacilli and produce the disease. The pigeon is of special interest in this argument because of its inherited immunity to the bacillus of human tuberculosis; but while it successfully resists this disease, it does not resist all diseases. I believe it is possible to present an overwhelming mass of experimental evidence to show that a truly healthy organism is endowed with blood cells which are able to attack and destroy very large numbers of intruding microbes.

Laboratory investigations with living animals show conclusively that the blood cell of the healthy non-impressionable subject, attacks, absorbs, and digests tubercle bacilli with energy and dispatch. On the other hand, the blood cells of certain individuals, and even of all of the individuals of certain varieties, do not have the power of destroying tubercle bacilli; and then, no matter what the medicine or food or other external influence, off goes the subject with tuberculosis. The prevention of disease in such an individual, like the making of Dr. Holmes' gentleman, must be begun by selecting proper ancestors. To protect absolutely from pathogenic germs would, of course, prevent the development of their respective maladies; but to do this is hopeless. To do it in part is practicable, and we must push the work to the limit, but hygiene must do more. Eugenics as a science

must be studied and applied by hygiene in its great and good work of disease prevention. Heredity is a force which hygiene must employ.

Dr. Hill in his excellent series of articles entitled, "The New Public Health," says: "The old public health was concerned with the individual. The old showed the sources of infection in the surroundings of man; the new finds them in man himself." Dr. Hill's reference is to the infections which are found in man himself; that is, man himself cultivates and carries and transmits among the members of his race the disease infections. A true and wise utterance indeed, but not the last word.

A statistical investigation of certain eye diseases, especially myopia of a high grade, has shown that the first born children of families hereditarily affected are much more liable to have eye defects than later children. The consanguinity of the parents is also shown to be a predisposing factor. Further, statistics show that myopia is more frequently transmitted by the mother than by the father. Female children are more apt to inherit myopic defects than male children, while the males show a greater tendency to the inheritance of other eye lesions.

Recently Professor Karl Pearson gave a curious instance of the inheritance of cataract. He reported records of a woman who suffered from cataract of the eye and who had now living thirty-nine decendants, all of whom were sufferers from cataract.

Certain it is that a disposition to tuberculosis may be inherited. From the parents may descend tissues which actually offer an hospitable soil to tubercle organisms. Again, resistant tissues or cells may be inherited which present an inhospitable soil.

For soldiers, men are selected who are not simply physically strong but who have not suffered from sickness and whose parents have had a fair freedom from sickness. Very common observation discovers that short lived lines of stock exist. Generally a long lived person has long lived ancestors. The insurance companies make practical business use of all of these and of many other like facts.

Research by Tyzzer, Mayit and Haaland in Norway and the collective inquiries in Germany and Holland all confirm the influence of heredity in cancer; and it has been suggested that probably no one can have cancer who has not inherited the peculiar or weak cells capable of being affected. We know that all sorts of physical, mental and moral defects are transmitted with fatal precision. We do not inherit strength; that is the result of nurture; we inherit the ability to acquire strength, that something which may be developed into strength.

If this is accepted, then failure to be born with the trait which makes possible the acquirement of strength, means weakness, which no amount of nurture can overcome. Weakness means openness to the invasion of infections. It is true, no matter how strong the tissues may be, nor how

capable the cells may be to produce antibodies, they cannot withstand an overcharge of infection. Therefore, both strong and weak may have germs caused diseases, but those who have inherited resistent tissues or a strong power to produce antibodies, have the most desirable inheritance.

Epilepsy, sick headache and certain insanities are certainly hereditary diseases. These are really unbalanced or defective states of nerve composition which never can be trained or doctored to normal vigor or resistance.

Surely we must go back of the microbe to find the true reason for disease, or should I say—to find the conditions which permit ordinary acquisition of disease. For it seems true that from the force we call heredity is derived the blood cell in the non-impressionable subject which enables him to withstand physical strains and the onslaughts of large numbers of disease organisms.

It has been said "we are the plaything of the forces of nature," and so we are if by this is meant we are governed by inexorable law.

And the lesson we are to first learn is—that we must know the law and obey it. This understanding will indeed finally enable us not only to realize and fulfill the grand inspired message of Pasteur—"It is possible to drive all parasitic diseases from the earth," but also, that all diseases and all defects of body and mind may be controlled in great degree.

PERMISSIBLE LIMITS OF SEWAGE POLLUTION.

A SYMPOSIUM OF EXPERT OPINION RELATING TO NEW YORK HARBOR.

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Starting with the fact that the water of which sewage is chiefly composed must eventually be discharged into some natural body of water and recognizing that it is usually impracticable to remove all the impurities beforehand, the question arises—To what extent must the sewage be purified?

In arriving at an understanding of this subject, many general statements can be made, but upon attempting to apply them to any particular case, it will often be found that they are lacking in that definiteness and suitability which is necessary in order that they shall have practical value. So much depends upon the uses to which the natural body of water is put after the sewage is discharged into it that hard and fast requirements are difficult to lay down. In some cases the most complete purification which it is possible to give will not be too much, while in others it will be permissible to discharge the sewage in practically crude condition. Each situation requires to be considered separately.

An instance in which the need of careful study of the local conditions was clearly recognized and a situation of more than ordinary importance from various standpoints recently arose in connection with the work of the Metropolitan Sewerage Commission of New York, which is a board of engineers created to make plans for the protection of New York harbor against excessive contamination by sewage. The commission has recently drafted a report in which the permissible limit of pollution for the harbor is fully dealt with and a definite standard of cleanness for the water proposed. In addition to the conclusions of the board, the report contains a number of opinions of sanitary experts who were engaged by the commission to express their individual views as to the desirability of establishing a standard of cleanness for the harbor and of the provisions which such a standard should contain. Following is a statement of the qualifications of the experts, the questions which were submitted to them and a synopsis of their replies.

THE EXPERTS.

The experts were selected from the professions of engineering, chemistry, biology and sanitary science. Each was given a list of questions to which

he was asked to make written reply. The experts were afforded facilities for inspecting the harbor in order to become personally acquainted with the conditions created by the present method of disposing of the sewage and with the uses to which the harbor waters were put, and were furnished with the printed reports of the commission. There were eight experts; their qualifications were briefly as follows:

A foreign chemist: an eminent authority on the chemistry of sewage-polluted tidal waters and a contributor to the Fifth Report of the Royal Commission on Sewage Disposal of Great Britain.

An epidemiologist: noted as an author and authority on the transmission of communicable diseases.

A sanitary engineer of wide practical experience in the design, construction and management of sewerage and sewage disposal works.

A civil engineer, Past-President of the American Society of Civil Engineers and of much experience in sanitary work.

An American chemist: professor of chemistry in a prominent technical school and author of various books on sanitary subjects.

A hygienist: professor in a well known technical school, author and prominent sanitarian.

A health officer and chief engineer of one of the most progressive state departments of health in America.

A biologist, experienced in sanitary investigations particularly with reference to the purification of sewage.

THE QUESTIONS.

The questions follow:

1. Do you think it would be desirable and feasible to establish a standard of cleanness for the waters of New York harbor?

2. If a standard is established, should it be based solely on chemical analyses or would a mixed standard which would take into consideration the appearance of the water and perhaps its physical, chemical and bacterial condition be better?

3. Should a standard of cleanness rest upon the amount of sickness and death which can be shown to be produced by pollution or should the standard be based on what seems suitable and appropriate on the score of cleanness?

4. Should the waters be kept pure enough for bathing and, if so, where?

5. Should the waters be kept pure enough for oyster culture and, if so, in what parts of the harbor?

6. Should effervescence, marked discoloration, decided turbidity, oily sleek, floating solid sewage materials or deposits of sludge be permitted anywhere in the harbor and, if so, where and under what circumstances?

7. Should we establish one standard of cleanness for the whole harbor or should there be different standards for different parts of the metropolitan district?

8. If a definite standard of cleanness is desirable, how should that standard be expressed? Please give us a draft of your opinion as to the proper wording?

9. "Will the amount of dissolved oxygen in the waters of the harbor, expressed in a per-

centage of its saturation value, furnish a reliable index of the cleanness of the water and, if so, what percentage should be adopted to secure each of the following results:

(a) That the waters of the harbor may not become offensive under any weather conditions.

(b) That the use of public baths, if judiciously located, may not be prejudicial to the health of those using them.

(c) That shellfish taken from the beds in present use may be eaten without danger to health.

If the percentage of dissolved oxygen will not furnish a satisfactory standard, what standard would you suggest, and should it be based upon chemical analysis, or should it take into account chemical, physical and bacterial conditions?"

THE REPLIES TO THE QUESTIONS.

All the experts considered that provisional standards of cleanness for the harbor should be established. Some favored one standard; some another. In no case was a standard proposed solely in terms of chemical or biological analysis.

All laid emphasis upon the appearance of the water and insisted that the standard of cleanness should be so framed as to provide that the water should look clean. All were of opinion that the standard of cleanness should not rest solely upon the effect of the harbor water upon the health of the people who lived in the nearby cities, or passed over the waters in ships, or worked upon docks and piers, or sought recreation in the parks on shores.

So far as sickness was concerned, it was the epidemiologist's opinion that the present condition of the harbor was not a serious menace to health; but he thought this no reason why sewage should be permitted to defile the water. Strong reasons existed for keeping the harbor clean. There was a public demand for clean highways and clean waterways as well. To the occasional visitor to New York, it appeared that the limit of permissible pollution of its waterways had been reached. The waters were evidently heavily polluted with sewage.

The American chemist considered that the amount of disease and death directly produced would not be a proper measure of the objectionable nature of the harbor's condition. Conditions which offended the senses, and the existence of which conditions he saw abundant evidence, should also be taken carefully into account, for such conditions indirectly lead to disease.

The civil engineer pointed out that while many lives probably could be saved and much ill health alleviated by reducing the pollution, it was still more important to consider the question of a clean harbor from the standpoint of what was suitable and appropriate on the score of cleanness. It was a case where civilization demanded a remedy on the score of what was necessary for the comfort, happiness and welfare of the public.

BATHING AND SHELLFISH.

There was a preponderance of opinion among the experts that it would not be practicable to keep the waters of the inner harbor clean enough to make bathing entirely safe, but it was held to be both feasible and desirable to maintain bathing places near the sea, and within easy reach by the public, in satisfactory condition. Because some bathing was likely to occur in the populous parts of the harbor in spite of any restrictions which might be made, and because the shores were certain to be crowded with human beings engaged in gainful occupations or seeking the water-front for relaxation and fresh air, the hygienist and others thought the water along the shores ought to be kept as clean as practicable.

In the opinion of the sanitary engineer, it seemed probable that if the open waters of the harbor were kept as clean as the requirements of business, pleasure and recreation demanded, there would be little danger to the public health, provided bathing and the taking of shellfish for food were restricted or prohibited. The foreign chemist did not think there was great danger in bathing, provided analyses showed that the water contained plenty of oxygen, was comparatively free from ammonia and there was absence of visible sewage matters. The epidemiologist did not consider that there was great danger of sickness from bathing in polluted water unless the sewage was discharged close to the bathing places. On the other hand, the sanitary engineer found it impossible to avoid the conclusion that considerable sickness was produced by bathing in the polluted water of New York harbor.

All thought it unnecessary that the waters of the inner harbor should be kept pure enough to make bathing perfectly safe, if suitable bathing places, such as Coney Island and Rockaway, could be maintained in satisfactory condition. The hygienist would have such bathing places as Coney Island kept in scrupulously clean condition. The civil engineer did not think it practicable to make bathing in the waters of the inner harbor entirely safe against disease, and regarded this as an unreasonably high standard of cleanness to seek to maintain. The American chemist considered that it would not be possible to keep the water in any part of upper New York bay clean enough for bathing and thought that bathing establishments on the water-front of Manhattan and Brooklyn were a menace to public health. The very presence of these places, he pointed out, was a guarantee by the City authorities of the safe character of the water. The biologist expressed the opinion that the waters of the inner harbor should be abandoned for bathing and shellfish culture. The waters of the Lower bay could, he thought, be kept clean enough for bathing and the cultivation of shellfish and should be maintained in that condition.

All the experts considered it impracticable to keep the waters in the inner

part of New York harbor pure enough for oyster culture, but, with care, it seemed to some to be possible adequately to protect the oyster grounds near the sea. The value of the oyster industry did not appear to the sanitary engineer to be of sufficient consequence to warrant the construction of the expensive works which would be necessary to insure to the waters of the inner harbor a sufficient degree of purity to warrant oysters being taken from them. The hygienist did not consider the oyster business to be of enough importance to warrant the expenditure of large sums of money to secure any special degree of purity for the waters. The danger of pollution from passing ships was so great as to forbid the culture of shellfish in New York harbor. The civil engineer felt that shellfish should be protected against sewage in areas which are remote from centers of human activities, if this protection could be made genuinely effectual. The health officer would not permit oysters to be cultivated anywhere within the metropolitan district except under strict supervision and control, and the biologist thought it might ultimately be necessary to sacrifice all oyster beds within the metropolitan district.

VISIBLE POLLUTION.

All the experts held the opinion that, while visible evidence of sewage was practically unavoidable near sewer outfalls, large sewage solids should not be present anywhere in the harbor except, perhaps, to a limited extent from the shipping. A small amount of oily sleek was permissible, but sludge and the escape of gases due to putrefaction should be prevented. The foreign chemist believed that sewage solids, either floating or deposited, and gas should certainly not be permitted anywhere except such as come from boats, but that some discoloration and turbidity might be allowed in the vicinity of suitably situated outfalls. The sanitary engineer considered that turbidity and discoloration might be tolerated over relatively small areas in the immediate vicinity of properly located sewer outfalls, and oily sleek be allowed, provided it consisted simply of very thin films of oil in isolated and relatively small areas. The civil engineer would not permit sewage to be visible at the points of sewage outfall or elsewhere, and thought that the sewage should be purified or discharged into deep water under circumstances which would prevent its appearance from the shores, docks and other places where it might prove offensive. The water should not be allowed to become so polluted as to be blackened. Deposits of putrefying sludge should not be permitted to occur along the docks.

In the opinion of the American chemist, the presence of oily sleek was not objectionable since he did not consider it unsightly and an infinitesimal amount of oily matter might produce it. He considered that it would be impossible to keep the water free from discoloration and turbidity, on

account of the natural silt which the Hudson river carried down from the northern part of the state. Floating solid sewage material should not occur. Conditions which were disagreeable or disgusting either to the sight or smell of the average citizen using the waters for rowing, sailing or similar pleasure purposes, the hygienist thought, should not be permitted.

The health officer felt that the visible evidences of sewage were so objectionable, and already existed to such an extent, that immediate steps should be taken to construct a system of main drainage and sewage disposal. This view was also held by the epidemiologist and others. The civil engineer expressed the opinion that no time should be lost in determining upon, and beginning, this work, so that the pollution of the harbor might be reduced rather than increased, a result which he considered inevitable if wise action was not soon begun. The biologist's opinion was that occasional discoloration, turbidity and sleek could scarcely be avoided in the vicinity of a great city, but these conditions should not be permitted to become persistent or of frequent occurrence, otherwise they would constitute what he regarded as a shortsighted and uneconomic waste of one of the city's most precious assets.

DISSOLVED OXYGEN.

So far as the permissible draught upon the oxygen was concerned, there was no unanimity of opinion. All who expressed themselves upon this point considered that a deficiency of 50 per cent. indicated serious conditions. The civil engineer's idea was that the sewage should not anywhere reduce the percentage of dissolved oxygen below 50 per cent. In the neighborhood of permanent or comparatively permanent beds for the cultivation of shellfish, the standard should insure bacterial purity. In the vicinity of bathing places, the water whould not only be of a high standard bacterially, but should also be free from floating sewage, should have a large amount of dissolved oxygen and should be chemically near to the normal condition of pure salt water or water of the normal salinity due to its position. In the neighborhood of docks and thickly populated shores, it might be sufficient to provide a physical standard of purity.

The American chemist was not prepared to suggest a definite amount of oxygen as the best permissible to maintain, although he believed 70 per cent. was an unduly severe measure by which to be guided. He considered that the physical appearance of the water, more complete chemical analyses than determinations of dissolved oxygen and bacterial examinations should be included in the standard of cleanness.

For the more polluted parts of the harbor, the biologist suggested that the dissolved oxygen be at no time and at no place allowed to fall below 50 per cent. of its saturation value. No effervescence, marked discolora-

tion, decided turbidity, oily sleek, floating solid sewage materials, deposits of sludge, or other conditions offensive to sight and smell, should be permitted in any part of the harbor. For the less polluted regions, the outer bay, for example, the standard should be primarily sanitary and should rest upon bacterial rather than chemical data.

The foreign chemist would establish a higher standard of purity than any of the experts mentioned, so far as oxygen was concerned. He would not permit the oxygen to be exhausted below 60 or 70 per cent. of saturation, at low tide under calm weather conditions and at any point within 200 yards of a point of sewage discharge, either at the surface or any depth below it. Before discharge, the sewage should be freed, as far as possible, of solid matters by means of mechanical subsidence, or, in the case of unfavorably situated outfalls which it would be difficult or impossible to remove, by chemical precipitation. In his opinion, such a requirement would insure proper protection to the harbor without undue hardship upon the taxpayers. The water beyond the neighborhood of the sewer outfalls would, in all probability, show no appreciable deficiency in dissolved oxygen, not even when the volume of sewage to be disposed of became largely increased with the increase of population.

OPINION OF THE COMMISSION AS TO THE DEGREE OF CLEANNESS SUITABLE FOR THE WATERS.

With regard to the degree of cleanness which should be maintained in the harbor waters, the commission has officially recommended the following specific requirements:

1. Garbage, offal or solid matter recognizable as of sewage origin shall not be visible in any of the harbor waters.

2. Marked discoloration or turbidity, due to sewage or trade wastes, effervescence, oily sleek, odor or deposits shall not occur except perhaps in the immediate vicinity of sewer outfalls, and then only to such an extent and in such places as may be permitted by the authority having jurisdiction over the sanitary condition of the harbor.

3. The discharge of sewage shall not materially contribute to the formation of deposits injurious to navigation.

4. Except in the immediate vicinity of docks and piers and sewer outfalls, the dissolved oxygen in the water shall not fall below 3.0 cubic centimeters per litre of water.* Near docks and piers there should always be sufficient oxygen in the water to prevent nuisance from odors.

5. The quality of the water at points suitable for bathing and oyster culture should conform substantially as to bacterial purity to a drinking water standard. It is not practicable to maintain so high a standard in any part of the harbor north of the Narrows, or in the Arthur Kill. In the Lower bay and elsewhere bathing and the taking of shellfish cannot be considered free from danger of disease within a mile of a sewer outfall.

*With 60 per cent. of sea water and 40 per cent. of land water and at the extreme summer temperature of 80 degrees F., 3.0 cubic centimeters of oxygen per litre corresponds to 58 per cent. of saturation.

SOME ECONOMIC ASPECTS OF FACTORY HYGIENE.

WINTHROP TALBOT, M. D.,
Editor, Human Engineering, Cleveland, Ohio.

Read before the American Public Health Association, Washington, D. C. September, 1912.

Successful manufacturing is the art of making things at a profit. Because long established or exceptionally well-managed concerns pay steady dividends, manufacturing is not necessarily profitable. A manufacturer must count his costs.

The majority of manufacturers throughout the land are engaged in establishing new enterprises. They are fighting the wolf and have to figure how to avoid those small expenses, which if allowed, eat up profits, and would result in shutting down the business.

The habit of scrutinizing expense accounts sharply and continuously is the basis of existence in a manufacturing business. Therefore, in advocating an administrative policy of any kind in a factory the first question must be "Does it pay?" Even in an old established and profitable concern—in view of expensive, unavoidable and constant changes in process and methods, and the threatening pressure of alert competition,—maintenance of vitality depends upon this constant querying. "Does it pay?" must be the first obstacle to meet any proposal, and especially a procedure in an untried direction.

Men think as they are trained to think. Therefore, before advocating hygienic changes in factory conditions and processes, an educational campaign should precede. Let us make it our business as physicians to teach the cost of the human mechanism, the mechanics of humanity and the extravagance of human waste.

By accurate translation into terms of dollars and cents, humane dealing becomes good business. Charity and philanthropy have no place in industry, but kindliness is not charity, nor is generosity, alms-giving. A keen and wise employer generally is both kind and generous. For these reasons let us combine sense with sanitation, and hardheadedness with hygiene. Do not advise a $2,000 system of ventilation for a $4,000 shop, or outrun for frills the margin of return on the workers' capitalization.

It is through the neglect of costs that thoughtless and unconsidered statements and criticisms by social workers and amateur reformers chain the wheels of progress and retard real improvement, through arousing needless and obstinate opposition and by trying to drive rather than convince. Every wise employer must be governed by his own intelligence.

To accomplish hygienic reform in manufacturing—like any other reform, publicity of Fact is the first essential, and the Fact is that Hygiene pays.

Rich natural resources, new mechanical devices, wide markets, small selling expense, slight competition, and the flood of labor, for years tended to cheapen human life. But today industrial conditions are different. Labor is harder to get, competition is keen, selling is expensive, mechanical invention is limited, and natural resources are restricted. In the race for efficiency the human element is receiving more study, because costs must be cut and human skill is relatively too expensive.

Material, methods and men are the basic trinity of production. For years material and methods have received expert study, but men have been neglected.

Ten years ago, a philanthropic wave of welfare work carried away employers partly because it made a subtle appeal to the sense of masterly control, partly because it was a cheap form of advertisement, and partly because it seemed a way of getting things cheap off the human bargain counter. Even today, we hear employers speak of "doing things for their employees" when in truth it is for their own business advantage.

Of late another and a broader view has dawned upon the mind of the employing world, namely, that labor to be cheap must be efficient, and that human efficiency depends upon Motive and Environment. In this newer aspect, conditions of employment present an economic problem solely—not questions in philanthropy or charity.

Today one buys labor,—one does not give employment. The housekeeper is no longer mistress, the iron-master is passing. The age of master and man has gone forever, the age of co-operation is here. Labor is a force to be sold, like electricity: it represents the capitalization of mankind. Skill, expertness, training, and experience are forming new social distinctions, and are breaking down the old lines of caste.

The problem of human efficiency thus is an economic problem solely, and sanitation is a factor in it. Sanitation is a means of saving dollars and cents, for it determines environment, and environment with motive is efficiency.

If then, factory sanitation has become a question of cost, not of sentiment, what part shall this national organization play in the great industrial world of today? What attention shall the American Public Health Association give to Industrial conditions?

The problems of sanitation and hygiene in industry are as individual and as difficult as are the questions of sanitation and hygiene in schools, or in municipalities, and the study of them is essential to the health of an industrial nation.

Industrial disease is a misleading term, used for convenience only, or

through ignorance, to indicate certain pathological states, the results of insanitation in industry. Industry itself is never necessarily unwholesome. Industrial processes, it is true, are objectionable and crude oftentimes, but bad industrial conditions are always remediable. What steps shall this Association take to investigate, study and remedy them?

The Associations presents to the choice of members the following sections:

Laboratory,
Vital Statistics,
Municipal Health Officers,
Sanitary Engineering,
Sociological.

None of these sections deals with work conditions.

Permit me to propose that the Association take another step forward. Let this step be the inauguration of a section of Work Conditions—not of Industrial Disease or Industrial Hygiene,—for that would limit the work unduly, but a section to explore the physiology, psychology and pathology of Work.

With 98 per cent. of our population engaged in daily toil, clinical material is not lacking for such a section.

A section on Work Conditions would attract interest, cordial support and financial backing from the host of able employers who are seeking to better Work Conditions in industry throughout the land, and would undoubtedly become a potent means of increasing the usefulness of our Association. May we not take this step forward now—not later, not next year, not when greed has died and ignorance has fled,—but now, when forwarded by this meeting, given impetus by the present International Congress of Hygiene, and emphasized both by the meeting on Safety next week in Milwaukee and by the Congress in Indianapolis on the Conservation of Vital Resources, the new crusade for progress, for wiser and better living, shall have been started, which is destined to make of the United States the greatest and noblest nation of splendid human beings of which the world has ever dreamed.

POINTS OF CONTACT BETWEEN THE HEALTH OFFICER AND THE SOCIAL WORKER.

HOMER FOLKS, LL.D.

Secretary State Charities Aid Association, New York.

Read before the Sociological section of the American Public Health Association, Washington, D. C. September, 1912.

The coming together of health officers and social workers is one of the most important developments of social work, as it is also, in my judgment, in public health service. This drawing together of these two groups is not accidental nor altogether voluntary on their part. It is the inevitable result of higher standards of efficiency in social work and in health work, and of the development of medical and social science. Health officers and social workers have met because their work brings them to the same place, namely, the home in which there is both communicable disease and poverty.

The health officer has witnessed a great extension of the scope of his work in recent years. The number of diseases listed as contagious or communicable is constantly being extended. His sphere of influence is also being extended to diseases that are not necessarily communicable. From being regarded as a *superman*, to bring into action huge and unusual engines of warfare when some plague is at our doors, he has come to be regarded as a *real* man, bringing into action the usual and ordinary human resources every year, and throughout the year, against those diseases which exist in every community, and all the time, but chiefly in the homes of the poor. The health officer has comparatively little to do with the well-to-do; their medical advisors can care for them. It is among those who are already in the "submerged tenth," or on the border line, that disease spreads most quickly, finds least resistance, and works the greatest havoc. Does not every health officer find that one of the greatest obstacles in the way of control of contagion is poverty, expressing itself in terms of overcrowded rooms, undernourished persons, and insufficient care for the sick.

These are, however, the very circumstances and conditions with which the social worker is also contending. If the social worker were to confine himself strictly to family rehabilitation, to "case work," he would, nevertheless, be brought into frequent contact with the health officer in the homes of the poor, and there they would be contending with the same obstacles and striving toward the same ends. Poverty and disease are reciprocally and mutually cause and effect, and no one, of whatever profession, can deal effectively with either without taking the other into account at every stage.

The social worker can be of great assistance to the health officer in helping to secure and sanitary conditions in the homes of the very poor in which communicable disease is found.

From this original point of contact, however, in the home, there stretches a wide range of opportunity for fruitful coöperation. The social worker, if he is to preserve his mental and moral integrity, must be interested in the prevention of poverty. The health officer, in seeking to prevent disease, is doing exactly the same thing, though designating it by a different phrase. Recognizing the health officer as one of his strongest allies, the social worker can be helpful to the health officer in a number of directions. The social worker has the public ear from a different angle, so to speak. He is in touch with those who make public opinion. Throughout the community there is a presumption that he is disinterested. He has perhaps almost an unfair advantage in that his calling is generally recognized as an altruistic one.

The social worker can help the health officer first to secure adequate appropriations for carrying on his work. Few health departments measure up to anything like an adequate performance of the duties imposed upon them by law, and chiefly by reason of the fact that in the competition for public funds, they have been unable to successfully press their claims as against those other departments which have the support of powerful interests. Social workers have been actively concerned in many localities in the securing of adequate appropriations for public charitable institutions. They are now finding that it is quite as strictly in the line of their duty to press for adequate appropriations for the preventive work carried on by health departments. A notable example of successful effort in this direction was the comprehensive campaign carried to a successful conclusion by the Charity Organization Society's Committee on the Prevention of tuberculosis in New York City a few years ago, whereby the appropriation to the Department of Public Health for its tuberculosis inspection and supervision was increased by some three hundred thousand dollars per annum.

The social worker can be of substantial service secondly, to the health officer in supporting proposed legislation affecting the powers and duties of health authorities. A large part of existing health legislation is based on an obsolete conception of the health officer, the nature of contagious diseases, and of the methods of their prevention. Proposed legislation extending the powers and duties of health officials is apt to be looked upon askance if supported only by health authorities. Medical societies are apt to be half-hearted, if not indifferent or hostile. The active and organized support of social workers and of the agencies which they represent would turn the scale in many cases in favor of affirmative action.

In addition to legislation and appropriations, which may be termed the

essential conditions of efficient health service, there is also necessary an enlightened and interested public opinion. The final limitation on the efficiency of health administration is the actual public sentiment of the locality. This public sentiment, however, is a matter of popular education. Communities can be educated just as individuals can be, and can be re-educated when they have been wrongly educated. The lay organization, if it proceeds in close coöperation with the medical profession, and with full scientific support for its statements, can be of enormous assistance in creating a public opinion which will not only make possible, but will require high standards of public health administration.

The social worker can render valuable coöperation to health officers in these and other ways. It is also true that the health officer can render invaluable support to social workers in the care of needy families and other forms of direct relief and assistance. The social worker is constantly dealing with families who are, as it were, in a peculiarly exposed condition from a sanitary point of view. It is inevitable that the families who come to the social worker will be found to be occupying many of the most unsanitary tenements and houses, will be found to be living in conditions of unhealthy and indecent overcrowding, and by reason of the facts and conditions which have brought them into distress, will be in many cases of low viatlity and ready to fall easy victims to the pestilences that walk in the darkness of unlighted rooms. The trained and conscientious social worker feels it one of his imperative duties to place all the families assisted by him under sanitary conditions, to raise their standards of living in whatever ways may be necessary to counteract further loss of vitality and loss of character. In all this, a strong, courageous, efficient health administration is his most important ally—a health administration which will have secured from the municipality the necessary funds for the construction of hospitals for the isolation of contagious diseases, a health authority which maintains these hospitals with such efficiency that there is not added to the natural fear of a pest house the further horror of an institution overcrowded, undernursed, insufficiently fed, and ruled by brute force; a health administration which has inspired the formulation and adoption of adequate housing regulations, and which fearlessly enforces minimum standards of light, ventilation, and number of persons per room, regardless of whoever the owner may be; a health administration which watches with vigilant eye against those impurities in water, milk and food supplies which bring typhoid, and promote infant mortality; a health authority which sends physicians and nurses to the homes of the tuberculous poor with instructions and facilities whereby the probability of the spread of infection may be decreased,—in these and countless other ways the health officer can buttress and strengthen the relief agencies and social work generally of the community.

And, of course, aside from individual families, everything which the health officer does looking toward the prevention of disease is, *per se*, also the prevention of poverty. It is almost impossible to overestimate the extent to which the problems of social work will be simplified when health administration is brought up to anything like its reasonable possibilities. The population of orphan asylums and the burdens of child-caring agencies will be enormously diminished; the number of families applying for relief because of the sickness or death of the wage-earner will be greatly reduced; the number who become permanent burdens in almshouses, homes for incurables, and other charitable institutions will be greatly diminished. It is, therefore, the plainest possible duty of all social workers to use every effort, both as individuals and in their official capacities, to uphold, strengthen, dignify and develop health administration.

Some words of caution, though not of misgiving, may be in order. There is danger that points of contact may become points of conflict. The social worker is somewhat new in this field, and naturally at first may be a bit awkward. In this as in every other department of governmental activity, it is difficult for the outsider, the private citizen, or private organization, to understand all the facts and to do full justice to public officers. One of our most unfortunate traits as an American people is that of too readily believing ill of our public servants, of not exercising a careful and discriminating judgment as between fact and rumor, of not seeing in due proportion necessary limitations upon official action, of not waiting until all the facts are in before forming a final opinion and acting thereon.

Dear Mr. Health Officer, if some social worker seems to you unfair, unjust, incorrect, superficial in his judgments of your activities, be patient with him, err on the side of *showing* him not once merely, but repeatedly; remember that he is no X-ray apparatus, that he can not see through your department and know what you are doing unless you tell him. Remember how deeply and vitally interested he is in effective health administration; take the utmost pains to show him the facts in every detail, and hear his point of view patiently. Deal with him with the utmost frankness; do not let the seeds of doubt, distrust and suspicion ripen and bear fruit. Whether the social worker be right or wrong, he can do a great deal of damage. It is important to obviate and avoid the damage, even though he may be mistaken.

Dear Mr. Social Worker, be very sure you are right before you go ahead; remember that powers and duties are apt to be conferred on health officers in large and in general terms, and that the application and enforcement of those laws must be determined in considerable degree, not by the largest meaning which *might* be read into them, but by the extent to which the public sentiment of the community has been interested and informed. Remember that the health officer probably has imposed upon him by stat-

ute at least five times as many duties as he can efficiently perform with the staff and funds provided for him by the fiscal authorities. Remember that it is easy to diminish public confidence in a public official, but very difficult to restore it; that through coöperation one plus one equals five, while through conflict one against one equals nothing.

Nevertheless, when all has been said, it is probably the social worker who will know first and see most clearly the strong and the weak points of health administration. If the weak points greatly outweigh the strong ones, and if, when all has been done, all efforts at coöperation fail, all efforts at joint activity come to naught; if, after every reasonable opportunity, it becomes evident here and there,—and it would only be in a small minority of localities,—that the health officer was appointed not to enforce the law, but to stand in the way of its enforcement; not to serve the public, but to serve the politician; not to promote public health, but to promote private gain, then it is very likely the social worker whose uncomfortable duty it will be to bring to bear upon the situation the wholesome influence of an enlightened public opinion. It would be a distressing duty, frequently misunderstood, but nevertheless it is an imperative one. The relation of efficient health administration to a constructive social program is so vital that nothing should stand in the way of securing the real thing. It is hardly necessary to ask this body of health officers, who are here because they believe in progress, to give their moral support to the social worker in those instances in which it becomes his duty, in order to secure efficient health administration, to oppose, expose, and perchance even to secure the removal of a particular health official.

Do not let me seem even to overstate the probable points of conflict. I know the social workers of this country; I know their attitude, spirit, purpose and fibre. I know that they look to you health officers, and to you physicians, for guidance and leadership. We expect you to take the lead. We want you to stand forward in the limelight when you are doing a good thing, even if it happens in some particular case that we have helped to set the stage and prepare the limelight. We want to see your position strengthened, your tenure of office more secure, your remuneration more adequate. Do not be afraid to lead. There may be times when new ground is to be broken, when public opinion may be uncertain, when it is better for the social worker to be put forward on the firing line. He is not in public office, and not subject to the recall. His budget is not provided by other public officials; he can properly take some chances which it might be wiser to enable the health officer to avoid for the time. In such cases do not hesitate to call upon us and send us to the front. But when we get there, if the battle goes our way, do not forget that you sent us, and do not feel that we are trying to carry away the laurels. We shall be

quite ready to take whatever place may be assigned to us on the following day, quite ready to serve again in the reserves.

The work we have both been called upon to undertake is so great that, under the most favorable circumstances, it will keep us all fully occupied for a considerable time to come. Team work is essential. Give us half a chance and we will get together and stay together. Community of interests will succeed points of contact, and health officer and social worker together will lead the community to direct its energies and expend its resources in bringing itself to an efficiency heretofore unrealized.

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SEPTEMBER SANITARY CONGRESSES.

The month of September was marked by the holding in the United States of three international congresses dealing entirely in two cases and through a single section in the third case, with the problems of public health. The Eighth International Congress of Applied Chemistry (with a section on Hygiene) met in Washington and New York between September 6 and September 13. The American Public Health Association met in Washington on September 18, 19 and 20. The Fifteenth International Congress on Hygiene and Demography met in Washington between September 23 and 28. The second of these three associations may rightly be included with the others, since it is international in its scope within the limits of the North American continent, and since its meeting this year was of so peculiarly notable a character.

The International Congress of Applied Chemistry held its inaugural meeting in Washington under the patronage of the President of the United States and the rest of its sessions in New York, the sectional meetings at Columbia University and the general meetings at the College of the City of New York. 2,173 members were in attendance and 535 papers were read. The management of the Congress was admirably efficient and the social features provided left little to be desired. At the hygiene section, which met under the presidency of Prof. W. P. Mason, 19 papers were presented with an average attendance of 26 persons. Naturally these meetings were smaller than those of the congresses devoted entirely to public health, but many of the papers presented were reviews of current practice in sanitary chemistry which were of unusual value. A paper by Dr. Samuel Rideal of England resulted in the appointment by the Congress of a committee of three members to co-operate with a similar committee from the International Congress on Hygiene and Demography

in the formulation of an international standard method for the testing of disinfectants.

The American Public Health Association held its fortieth annual meeting at the New Willard Hotel under the presidency of Dr. John N. Hurty. The meeting was noteworthy for two reasons. For the first time the newly organized sociological and sanitary engineering sections held meetings rounding out the organization of the Association, so that it is at last completely representative of all the interests involved in the modern public health campaign; and at both general and sectional meetings the character of papers and discussions reached a level of excellence which has never been equaled in previous years.

Since the papers presented before the Association will be published in this JOURNAL it is unnecessary to discuss them in detail. A word only may be said as to certain prominent tendencies. By far the most significant of these was the emphasis on sanity and perspective in public health activity. The day has gone by when it was perhaps necessary to catch public attention by the depiction of the real or imaginary horrors of indiscriminate unsanitary conditions. There is now ample popular support for public health activity. What is needed today is intelligent direction which shall indicate the most profitable lines of attack so that the public funds may be used with a proper sense of proportion. Such intelligent direction was clearly manifest in the deliberations of the Association this year.

Then new sociological and sanitary engineering sections were launched in the most auspicious manner. In both, the meetings were enthusiastic and inspiring; and the sanitary engineering meetings in attendance and in the value of papers and discussions were as successful as any ever held by either of the older sections of the association. Among others there were admirably rounded symposia on refuse disposal and on water supply and a stimulating discussion of the qualifications of the sanitary engineer for administrative public health work.

The crowning event of the month was of course the Fifteenth International Congress on Hygiene and Demography (under the presidency of Dr. H. P. Walcott), by far the most important sanitary convention ever held on this side of the water; 3,385 members were registered for the Congress of whom 131 were official delegates from foreign countries.

The Congress was opened by President Taft in a felicitous speech in which he referred particularly to the sanitary triumphs of the Panama Canal, and representatives of twenty-eight nations responded to the official roll-call. General lectures were delivered during the Congress by

Professor Rubner, Sir Thomas Oliver, Dr. Bertillon and Dr. Zahn and 510 papers were presented before the nine sections. Meetings were held in the New National Museum, the Pan-American Union and the Continental Memorial Hall and the arrangements in this respect proved altogether adequate. The Memorial Hall and particularly the Pan-American building furnished a dignified and beautiful setting for such an occasion and those who remember the Tuberculosis Congress four years ago can take satisfaction in these additions to the meagre facilities which existed at that time. There were receptions at the White House and the Pan-American Union and the New National Museum and boat trips on the river but no attempt was made at the elaborate entertainments which have made European congresses so enjoyable. Some of our foreign visitors expressed themselves as well pleased at the attention to business which resulted, but in future international conventions in this country a happy mean might be struck between the two extremes. The most serious drawback to the comfort of the congressists was the weather. It was most unfortunate that our friends from abroad should have seen Washington under such unusually unfavorable conditions.

It is of course impossible to attempt any general summary of the many important papers presented before the nine sections of the Congress. Abstracts of 243 of them were distributed in a volume of 297 pages at the meeting. Among matters of especially vital interest may be mentioned the symposium on hookworm disease in joint session of Sections I and VIII in which the results of American experience were well presented; the discussions of school inspection in Section III, the many valuable papers on occupational disease and occupational statistics in Sections IV and IX, the symposium on bacillus carriers in Section V in which the vaccine treatment of carriers was fully discussed, the papers on public health organization in England, Germany, Denmark, and the United States in Sections VI and VII, the symposium on the sanitation of foods in Section VI and the discussion of the spread of disease along routes of travel in Section VII

The most striking single incident of the Congress came in the joint symposium on poliomyelitis held by Sections I and V when Professor Rosenau made the preliminary announcement of his experiments on the transmission of that disease by the biting stable fly, *stomoxys calcitrans*. Here were the leading experts of the world taking counsel together as to the best means of fighting the obscure and sinister malady against which we have been almost helpless. After the formal papers the solution of the problem seemed as far off as ever, when an unannounced speaker in the discussion reported results which, if they are confirmed, may make the suppression of this disease as simple as that of yellow fever. It was one of those dramatic moments which will not soon be forgotten and which

make clear the splendid practical results of sanitary science, so often obscured by its slow and gradual growth.

The briefest review of the Congress would be incomplete without a word about the Exhibition. Dr. Schereschewsky deserves the thanks of all public health workers for this admirable exhibit. It must have astonished all Americans to see how effective a showing could be made and even some of the German visitors familiar with the wonderful exhibitions at Dresden and elsewhere had only praise for the results achieved. The topical arrangement of the exhibition was carried out with entire success, there was almost nothing shown that was not of value, and some of the exhibits were of high merit. Among the notable exhibits were those on mental hygiene and sex hygiene, the five sections on industrial diseases, in which the Massachusetts State Board of Health and certain private corporations were the principal contributors, the water and sewage models of the American Museum of Natural History, the food exhibits of the Bureau of Chemistry and the Bureau of Animal Industry, the exhibits of dental hygiene by the Rhode Island State Board of Health and others, the statistical exhibits of the New York City Board of Health and the Prudential Insurance Company, and the fly exhibit of the Asheville Board of Health.

Among the resolutions adopted by the Congress mention need be made of only one of the highest importance. This was the recommendation that the Permanent International Commission be instructed to establish a permanent bureau for future international congresses at the Hague. Medicine, pharmacy and statistics have each a permanent international bureau of this sort and it is a cause for congratulation that sanitary science too has taken this step forward in world organization.

THE PROPHYLAXIS OF BUBONIC PLAGUE.

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Read before the American Public Health Association, Washington, D. C., September, 1912.

So much has been written of late regarding plague that it seems almost wanton to discuss the subject before a body of men whose lives are given over to the study and control of epidemics of disease, both of exotic and domestic origin. It is however sometimes of value to consider a great subject like this in syllabus form, to remove the dross of detail, to evaporate the diluent of personal experience and to crystallize the salient facts of the subject. Long has humanity awaited deliverance from the bondage of plague and not the least of the great scientific achievements of the century in which we live has been the discovery of its causative organism, and the unraveling of the ramifications of its spread. We have taken information from every portion of the globe, have assembled and correlated it, and evaluated the formula upon which prophylactic measures are based. Like St. Paul, we are debtors "both to the Greeks and to the barbarians, to the wise and to the unwise," and the resultant product has worked to the lasting benefit and protection of the human race. Science has placed in our hands, as it were, a high powered weapon of precision and it is no longer necessary to use the blunderbuss of absolute quarantine to frighten off the plague, nor to burn cities to drive it out once it has gained entrance.

The prophylaxis of plague primarily comprehends the single basic fact that it is a rodent disease, and that if man allows himself to come in intimate contact with rodents and therefore to be exposed to the danger of plague, t is his own fault, Secondly, it has been recognized that the rat and his congeners are the great agents in the extension of the acute form of the disease, and that the ground squirrel and its allied species are responsible for the perpetuation of the disease in chronic form.

The prophylaxis of plague thus takes on two different phases, the control of plague in the genus *mus*, and the control of plague in the genus *marmota*. The one is more or less a matter of instant expediency, the other is a measure striking at the very roots of plague itself. If rodents are prevented from gaining access to the home of man, there is little danger of an outbreak of human plague; if the exodus of rats from plague foci is prevented, then the spread of the disease is thwarted; if the disease is checked among the *marmota*, then the infection of the *murinae* is rendered impossible.

These are basic principles. The making of these simple facts to live and

work is a matter of an infinitude of administrative detail and labor, a close study of local conditions and an accurate knowledge of the habits and bionomics of the different species concerned.

Thus far nothing has been said regarding the rôle played by the siphonaptera as the vehicles of dissemination of the bacillus pestis from the carcass of the plague infected animal to the body of the healthy man. While the flea does enter into the scheme of the prophylaxis of plague, it is in a minor rôle, his host occupying, so to speak, the center of the stage, because if we render the home of man flea free, we can keep it so, provided we exclude those animals which would bring fleas into it. For the practical prevention of plague it may be assumed that rodents are the chief animals engaged in carrying fleas into the home of man.

Plague prophylactic measures therefore arrange themselves under the following heads:

1. The protection of the home of man against rats.
2. The prevention of the migration of plague.
3. The protection of rats against infection.
4. Immunization of the individual.
5. Periodic rodent surveys.

In order to protect the home of man against plague, it is necessary, first, to make it impervious to the entrance of rats, and secondly, to maintain the premises in such condition that rats will not want to enter them, even if they have a chance. Nothing need be said here regarding the extermination of the rodent species, because we are not now considering the eradication of plague, but its prevention, and therefore the enormous labor and great expense which would be entailed by an attempt at extermination of rats would not be warranted. Furthermore, it may as well be admitted that the extermination of the rodent species in any place where plague might come has thus far proven the unending labor of a Sisyphus. It is true that poisoning, trapping, shooting and exposure to natural enemies, combined with rodent eviction, starvation and the prevention of multiplication will greatly diminish their numbers, but thus far there has not been recorded a single instance of their complete extermination. The limitation of the species is an important adjunct to eradicative work, because by reducing the number of rats their chances for personal contact and interchange of fleas is thereby rendered less frequent and less probable. This brings about what is virtually a dilution of the infectible material, and if carried far enough will of itself stamp out plague in rats. As a purely prophylactic measure, however, wholesale rodent slaughter is not indicated. The all-important thing is to prevent the rat from gaining access to the home of man. The methods of accomplishing this have been fully discussed elsewhere,* and it is merely sufficient to state here that

* See "The Rat and its Relation to the Public Health." P. H. B. No. 30. U. S. Public Health Service.

there is no building which cannot by one means or another be made impervious to rats. The exclusion of the rat should not be confined to the place where man eats and sleeps, but should include as well every building which is used for any purpose whatsoever. It is the great and enduring fact of plague prevention that he who dwelleth rat free taketh not plague.

The migration of rats particularly migrations in ships is responsible for the wide dissemination of plague. It is important then that rats, particularly those from plague foci, be prevented from leaving such localities. This measure entails the supervision of maritime commerce, the rendering of ships inaccessible to rats, their extermination, once they have gotten on board a ship, and the prevention of their landing from water craft, particularly those hailing from plague foci. This must be done with the least possible hindrance to commerce, and owners and masters of ships should be brought to realize that it is to their benefit as well as to the interest of shippers that vessels be kept rat free. This may be accomplished by periodic fumigation, the use of rat guards and other ship rat-proofing methods, and the building of ships containing automatic apparatus for the capturing of rats as soon as they come aboard.

The migration of rats within cities themselves should also be prevented. It should be the aim so far as possible to force them into the sewers, allowing them to continue their subterranean existence without coming in contact with man. This applies particularly to rats from the water-front, because it is in such places that epizoötics of plague usually first appear.

In this connection it may be remarked that it is also in the shipping districts that human cases usually first appear, and it has been the observation of Surgeon General Blue that such cases most often occur among sailors, or in sailors' boarding houses. This fact requires the rat-proofing of all water-front districts, the special observation of passengers and crews coming from such localities, and the prohibition of shipping crew or allowing shore liberty at infected ports. The great danger of the migration of plague from such places lies in the emigration of rats. The danger from human cases is an almost negligible factor, yet in this particular it should receive careful attention.

While rats are the cause of enormous losses every year on account of the property which they injure and destroy, and while it is desirable to limit the number of this species as far as possible, if we must have rats, they should be kept healthy, at least so far as plague is concerned. As has been shown above, if they are prevented from migrating from plague foci, there is no danger of rats becoming infected in regions where the disease does not exist provided that they are not permitted to come in contact with other animals having the disease. Plague in rats is more or less a secondary and accidental infection, as it is in man. The disease spreads among them like a flame in the dry grass. It is an acute, fulminant outbreak and develops

a rapidity of spread which is directly as the amount of infectible material, and the opportunity which the rodent population has for coming in close contact one with the other. In ground squirrels and the allied species, the disease assumes a chronic character after the first preliminary outburst and there it smolders like a bed of embers ready to burst forth in flame when fresh fuel is added. Such a condition is brought about by the transfer of the disease to rats in the area where the life zones of the two species overlap. If we separate the two species by a strip of land which neither one of them is permitted to occupy we prevent the spread of plague from one to another. This question has three aspects, the prevention of the spread of the disease among the *murinae, i. e.* the control of acute rodent plague; the prevention of the spread of the disease from the *murinae* to the *marmota* and vice versa; and the control of plague among the *marmota*.

The latter measure means the stamping out of the disease in the enzoötic foci among tarbagans and ground squirrels and is not only a national matter as it is with Russia in the Trans-Baikal and the United States in California, but is also an affair which should command an international interest. If the strong nations of the world will unite to form a permanent international plague commission and will support it with funds and authority, our generation will see the relegation of plague to the category of rare and almost extinct diseases.

The question of the immunization of the individual against plague may be mentioned merely to point out that as a wholesale prophylactic measure it is altogether impracticable because of its cost, the short period of the immunity conferred, and the discomfort and danger which are incident to its administration. At the present time its usefulness seems to be confined to the protection of laboratory workers and others who are in constant contact with plague material. A serious objection to its use is the fact that it is a measure of temporary value only, and by reason of the feeling of security which it engenders it defeats those more important prophylactic measures which are directed at the transmitting and disseminating agents themselves. Its wholesale use as a prophylactic is therefore to be condemned.

Perhaps the most important single measure which may be adopted by communities as a preventive measure against plague is the periodic inquiry into the health of the rodent community. This is relatively inexpensive, and a small force of well trained rat trappers can capture a goodly number of rodents from the various portions of a city in a relatively short space of time. The machinery for the examination of these animals need not be large, nor intricate, yet if this work is carried on with precision and accuracy it is the means of determining the presence of plague in the rodent community before it has had an opportunity to attack men. Once plague is so discovered it may be speedily stamped out at a comparatively small

cost, whereas if the disease had been allowed to gain large headway among rodents, there to go unchecked until one or more human victims had been claimed, the expense of eradication would be very high, and the harm which commerce would receive would be great and far reaching. However much we may fear plague from the humanitarian standpoint, it should always be borne in mind that in the end the great harm from plague comes through its injury to commerce. In this way, although it acts indirectly, it is as much a menace to health as if it attacked directly because anything which harms commerce throws people out of employment and reduces their wages, thereby lessening their food supply, depriving them of adequate clothing, and forcing them to live under conditions which are prejudicial to health.

In closing this paper there is one single thought which it is desired to impress. It is the duty of every municipality in those countries having a membership in this association to begin and continue an active warfare upon the rodent species. Above all, every measure should be taken which will keep the sanitary authorities constantly informed as to whether or not plague exists in the lower animals of any given community. Once it is found therein, it is equally the duty of the sanitary authorities to take prompt and active measures for its eradiction, and it is the bounden duty of our citizens to provide the necessary funds for the carrying out of such work. This is a true form of health insurance, paying the largest dividends, and granting the greatest security from the pestilence which traveleth in ships in the body of the scavenger of the ages and striketh in the darkness of ignorance and carelessness.

A MEASLES OUTBREAK IN CHICAGO.

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Recently there came under my observation an outbreak of measles, in which the facts were so striking and have such an important bearing upon both the transmission of the disease and the methods for its control that it seems worth while to report it.

Thirteen children attended the birthday party of one of the number. Two of the children had been suffering for three days with severe "colds," and had been kept out of school and indoors in order that they might be well enough to attend the party on Saturday. One of the children at the party I had myself treated for a very severe attack of measles about a year previously. One of the children, one of my own, had had an attack of moderate severity but perfectly distinct in type three years before. It so happened that most of the children at the party came from different neighborhoods and that in most instances the acquaintance which led to their being present at the party was an acquaintance between the children and not an acquaintance of any intimacy between the families concerned.

The day after the party the two children first mentioned developed typical cases of measles, but owing to the circumstances explained above, the fact that their children had been exposed to measles at the party was not made known to a number of families. Within eleven to fourteen days every child at the party except the one who had had an attack within the year had developed measles.

The case of my own child was sufficiently unusual to be a matter of interest as bearing on the question of an occasional appearance of measles with a perfectly anomalous history. Eleven days after the exposure at the party this child was seized with a fit of trembling and began to cry with severe headache. Within a few hours thereafter she was covered with a profuse eruption which at first was not typical, but in a few hours presented a perfectly typical appearance of measles. It was recalled that twenty-four hours previous to the onset of the attack the child had for an hour or so seemed to be a little less active than usual but not enough so to suggest to any of the family that she was ill.

One of the children at the party, B. F., developed a "cold" twelve days after the party. Her mother had not heard of the other cases of measles but wished to keep the child away from the convent school which she was attending. The child, however, begged to be allowed to go for some special reason and was permitted to do so. This was on the second day of the catarrhal stage. Some hours after reaching school she seemed to be a little

indisposed and the fact was brought to the attention of the Mother Superior. It so happened that just before this particular moment another child had been taken sick with a malady of an undetermined nature, and following the custom of the school, had immediately been isolated in what was known as the rest room until such time as she could be taken home, consequently there was no place in which B. F. could be temporarily put. It also happened that there was a class of girls considerably older than B. F. who were being prepared for their first communion, and were receiving instruction in a room apart from the rest of the school. As the principal was going to this room to give the instruction just at the time when it was noticed that B. F. was not well, she took the little girl, aged eight, along with her into the room where the class of older girls were awaiting instruction. There were fourteen of these girls. Later B. F. was sent home and the next day was down with the measles. Exactly twelve days from the date on which this class was held all fourteen of its members were taken with measles.

In addition, a number of the younger scholars who had been in the room with B. F. developed measles on practically the same day. In all, I have heard of forty-seven cases directly traceable to the sick children who went to the Saturday party.

I have made no attempt to run down the secondary and tertiary exposures, but have no doubt that if I could have done so it would have been easy to demonstrate that the fruits of these two cases ran up into the hundreds. One exposure, I know, went from Chicago to Kentucky, developed the disease there, and probably started a fresh focus.

Now, the remarkable unanimity with which the fourteen girls came down on the twelfth day is of interest as confirming the generally accepted length of the period of incubation, but as this period of incubation has been well established before, the occurrence of the disease in these cases is not of any special importance, though, as already said, the unanimity of onset is of interest; but the striking feature of this group of cases is that fourteen half-grown girls who certainly did not come into very immediate contact with a little girl of eight brought into the room while they were receiving religious instruction should all develop measles at all, let alone on the same day. Furthermore, the nine or ten children in the same schoolroom with B. F., who developed measles, did not come into any intimate or immediate physical contact with her.

It is difficult, therefore, to get away from the conviction that the prompt aerial transmission of the disease would seem to be pretty thoroughly established by this group of cases. Certainly contact could not have been a factor of any importance. The fourteen girls were seated in a large room, the little girl seated at one side of the same room. The period of exposure did not last more than one hour, if so long.

The other matter of interest is the demonstration of the entire futility of attempting to control measles by prolonging quarantine of cases the presence of which is not known until the eruption develops.

I have not taken space to go into the details, but I am satisfied that in nearly all, if not all, of the original ten cases there was nothing to have warned the parents of the children concerned that they had been exposed to a child with measles in the catarrhal stage, consequently each of these children, when in turn they developed the catarrhal symptoms, were permitted to come in contact with large numbers of other children in the school and elsewhere, as it seems that most all of these cases failed to be attacked with sufficient violence at the onset of the disease to cause them to be kept in bed.

We began in the Chicago Health Department in January, 1912, to terminate the quarantine of measles cases as soon as the temperature had been normal for twenty-four hours, following in this matter what seemed to be a reasonable deduction of Anderson and Goldberger of the Hygienic Laboratory who found that they were unable to transmit measles from monkey to monkey after the febrile stages had passed. It is too soon as yet to judge the result of this procedure, one reason being that the profession as a whole has not yet begun to take advantage of the change in procedure.

As far as we can tell, however, this increase in leniency has not resulted in any particular increase in the spread of measles. I must confess that, in view of the facts in the small outbreak given above, to my mind it is difficult to avoid the deduction that it is unnecessary to do more in measles than to keep out of school or away from other intimate or immediate contact with other children any children from families where a case of measles is occurring or has recently occurred.

DIPHTHERIA CARRIERS AND THEIR RELATIONSHIP TO MEDICAL INSPECTION OF SCHOOLS.

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Read before the Municipal Health Officer's Section of the American Public Health Association, Washington, D. C., September, 1912.

The recognition of the presence of diphtheria bacilli carriers among school children furnishes another strong argument in favor of efficient medical inspection of schools. With the increase of our knowledge in regard to the bacteriology of diphtheria, we have learned that the Klebs-Loeffler bacillus may linger for varying lengths of time in the nose and throat of persons who have recovered from an attack of diphtheria. In recognition of this fact most of our State Boards of Health have during recent years changed the basis for the release of quarantine for diphtheria from a definite time limit to the absence of diphtheria bacilli from the nose and throat as determined by bacteriological examination. According to the old time limit, the usual period of quarantine for diphtheria was from 28 to 35 days. According to the culture method the average period in Iowa has been about 16 days. Unfortunately, however, there are some in whom the bacteria remain so persistently that they can still be found for from five to seven weeks, in one of our cases for seven weeks and in one case on record for 23 weeks after clinical recovery from the disease. Another condition which has been the subject of considerable study in recent years has been the presence of diphtheria bacilli in the throats of persons who are not, nor, so far as known, have ever been affected by diphtheria. These diphtheria bacilli carriers are of most frequent occurrence when diphtheria is prevalent in a community. Fortunately the bacilli living under such conditions are frequently of low virulence and in some instances have lost their disease-producing power entirely. On the other hand, their virulence is often of full strength and even though they may not produce any disease in the carrier, when transferred to other persons, they may produce the disease in its most virulent form. It is very certain that diphtheria has been kept alive for months in institutions and communities by such carriers. Indeed it is quite probable that carriers with either a normal throat or a slightly "sore" throat, are the source of more cases of diphtheria than persons affected by well marked cases of the disease.

In view of such, the examination of the throats of school children is of the highest importance whenever there is an outbreak of diphtheria among

them. Such examinations should consist both of an inspection of the throats and of swabbing the throat for the purpose of making a bacteriological examination, for although it has been shown that the specific germs are found most often in throats that are "sore" as indicated by excessive redness, swelling or subjective symptoms, they are also frequently found in throats that are perfectly normal. The proportion of children not affected by what is recognized as clinical diphtheria but who are diphtheria carriers varies naturally according to the extent of exposure. In 1894, Park* found virulent diphtheria bacilli in about one per cent of healthy throats examined in New York City. In 1907, Fisher,† examining the throats of 4,081 healthy individuals living in the Connecticut Hospital for the Insane, where there were a number of cases of diphtheria, found that 2.08 per cent of them were diphtheria bacilli carriers. It has been shown by the examination of a large number of cases, that when clinical diphtheria is not present in a community about one per cent of the population are carriers of diphtheria bacilli, but that when diphtheria is present in a community the percentage is very much higher—ranging from 5 to 10 per cent. The percentage of carriers among healthy persons who have been quite directly exposed to infection, is often as high as 50. On account of the greater exposure of children in schools, the proportion of carriers among such children would naturally be higher than among the population in general. During the winter of 1910 the Chicago Board of Health found that 25 per cent of the children of two schools were diphtheria carriers. Last winter 25 cases of well recognized diphtheria occurred in two of the schools of Davneport, Ia. Bacteriological examination showed that 20 per cent of the other children of these schools were diphtheria carriers. The virulence test was positive in 90 per cent of the cases.

The controlling of diphtheria carriers in our public schools has been successfully done in a number of our larger cities. In the vast majority of localities, however, the solution of the problem by the culture method has not yet been attempted. The general public has little conception as to the significance of healthy diphtheria carriers and unfortunately there are still some physicians who deny the danger from this source. There is not yet, to my knowledge, a single State Board of Health in the United States that has adopted specific rules and regulations with reference to the finding and control of diphtheria carriers in the public schools. In most places, dependence is placed on the general rules governing cases of diphtheria and those intimately associated with such. In a number advice is given by correspondence whenever specific instances arise. Although our larger cities will take care of their sanitary problems quite independently of the

* Park, W. H.—Report New York City Board of Health 1894.

† Fisher, J. W.—A Diphtheria Epidemic. J. A. M. A., Feb. 6, 1909.

State authorities, the vast majority of communities will be guided principally by regulations of the State Boards of Health.

Procedure recommended for the control of diphtheria carriers in the public schools whenever diphtheria (clinical) occurs among the school children:—

1. WHENEVER THERE IS AN OUTBREAK OF DIPHTHERIA AMONG THE CHILDREN OF A CERTAIN SCHOOL, THE THROAT (AND IN SUSPICIOUS CASES, ALSO THE NASAL CAVITIES) OF EVERY PUPIL, TEACHER AND OTHER PERSON IN SUCH SCHOOL SHOULD BE EXAMINED BOTH BY INSPECTION TO NOTE THE CONDITION OF THE THROAT AND BY BACTERIOLOGICAL EXAMINATION.

2. THOSE WITH A "SORE" THROAT SHOULD BE SENT HOME IMMEDIATELY AND SHOULD NOT BE PERMITTED TO RETURN TO SCHOOL UNTIL PROVED BY BACTERIOLOGICAL EXAMINATION NOT OR NO LONGER TO BE DIPHTHERIA CARRIERS, OR IN CASE THE BACILLI PERSIST IN REMAINING AFTER A THOROUGH ATTEMPT AT REMOVING THEM, THE PATIENT SHOULD REMAIN ISOLATED UNTIL IT IS PROVED THAT THE BACILLI ARE NOT VIRULENT.

The diphtheria carrier, rather than the premises should be quarantined. The carrier should remain somewhat isolated from the other members of the family but such other members should be permitted to go in and out of the house to attend school or their places of business. It is advisable however to have the house placarded to serve as a warning or notice to have persons not members of the family, stay out. The card may be labeled as follows:—

"CARRIER OF DIPHTHERIA HERE—KEEP OUT."

It is likewise advisable to place in the hands of the family a circular explaining what is meant by a diphtheria carrier and the danger of such and advising them to call a doctor to the house to treat the nose and throat in order to remove the carrier condition. In case the family prefers I believe it to be advisable to have the medical work done by the health officer, if not a practicing physician, at public expense.

The following measures may be employed to rid the nose and throat of diphtheria bacilli:—

1. *Local Application of Disinfectants:*—The nasal cavities and throat should be sprayed with a mild disinfectant such as a solution of hydrogen dioxide (0.5 per cent by weight of absolute hydrogen dioxide which is the solution of hydrogen dioxide of the U. S. Pharmacopea diluted with 5 parts of water) or of some mild alkaline disinfectant as Carl Seiler's solution.

The throat will permit of more severe measures than the nose. A solution of 1 per cent by weight of absolute hydrogen dioxide may be used as a gargle or the surface may be swabbed with a 5 per cent solution of silver

nitrate. Care should be taken not to have such an excess of the reagent on the applicator that it will trickle to the larynx.

The local application of such disinfectants usually succeeds in removing the carrier condition in a few days. Sometimes however, more drastic measures must be employed before the germs disappear. Knowing that the crypts of the tonsils afforded a good hiding place for the bacteria we have tried the disinfection of such by the use of a swab dipped in a 10 per cent solution of silver nitrate and well introduced into the crypts. By so doing we succeeded in getting rid of the bacteria in 18 cases (all attempted) which remained as carriers after repeated swabbing of the surface. Squeezing the tonsils and forcing out the exudate often existing in the form of plugs from the crypts has been tried with some success by Kretschmer* who succeeded in freeing 13 patients from the carrier condition in which the more simple measures failed.

2. *Spraying with a Living Culture of Staphylococci.* In December 1909 Schiotz† a Danish physician described a method of freeing throats from diphtheria bacilli, which seems destined to be a procedure of very common use. It has proved successful in a considerable number of cases in which other measures failed and so far, no unfavorable results have been reported. Schiotz inoculated the throat with a pure culture of staphylococci. He obtained his suggestion from the fact that a person with a staphylococcic sore-throat placed in a diphtheria ward under a mistaken diagnosis did not contract diphtheria. He also found that the germs disappeared from several patients in whom after recovery from diphtheria, the specific bacilli persisted for some time, on the development of an ordinary staphylococcic sore throat. He reports the treatment of six cases with the staphylococcic culture obtained from a throat of a healthy person. The diphtheria bacilli disappeared after one inoculation of the throat of a man who had been detained in the hospital for three months as a diphtheria bacilli carrier, and a woman who had likewise been detained for two months. The other patients who had had diphtheria more recently recovered from the diphtheria condition with equal rapidity after one treatment with staphylococci. During the early part of this year, Page‡ tested the method with equal success. More recently Catlin, Scott and Day§ tried the staphylococcic spray on carriers in connection with an epidemic of diphtheria which occurred at the Rockford (Ill.) hospital. Out of a population of 70

*Kretschmer, M.—Zur Bekämffung der Baxillenpersistens bei Diphtheriercekonvalescenten, Medizinische Klinki, Berlin. Jan. 15, 1911, VII, No. 3.

†Schiotz, A.—Uskadeliggerelse af Infektionsbaere ved Difteri Ugeskrift for Laeger, Copenhagen, Dec. 16, 1909, No. 50. Abstr. in the Jour. Amer. Med. Assoc., Jan. 29, 1910, Vol. LIV, p. 422.

‡Page, H.—Diphtheria Bacillus Carriers, Archives of Internal Medicine, Chicago, Jan. 1911.

§Catlin, Scott and Day—Successful Use of the Staphylococcus Spray on Diphtheria Carriers, Jour. Amer. Med. Assoc., Oct. 28, 1911, Vol. LVII, p. 1452.

persons, 17 per cent developed diphtheria and 31 per cent became carriers. In spite of liquid antiseptic treatment, some of them continued to remain as carriers for a long time but the bacilli soon disappeared after the use of the staphylococcic spray. The spray used was a 24 hour-old broth culture of the Staphylococcus pyogenes aureus which had been isolated one year previous from a facial carbuncle and had been grown on agar continuously since. The material was sprayed into the nose and throat two or three times daily. In all cases the bacilli disappeared; in most of them within a day or a few days after the beginning of the treatment.

3. Those who have no Sore Throat may Remain in School until the result of the Bateriological Examination Indicates that They are Diphtheria Carriers. If Such is the Case they Should Remain at Home and be Treated as Mentioned Under (2).

4. If the Epidemic is Extensive Among the Children of a Certain School, Immunizing Doses of Diphtheria Antitoxin may be given to All and the Building may be Advisedly Disinfected With Formaldehyde.

The examination of all children for the diphtheria carrier condition when clinical diphtheria is not present in the community is not recommended since under such conditions the diphtheria bacilli of the few carriers that may be present are ordinarily of little or no virulence.* Nor is the closing of school, when the disease is prevalent, recommended since such makes it more difficult to discover those affected and to control the disease.

The institution of these procedures has put a sudden check to rather severe outbreaks of diphtheria in four cities in Iowa during the past winter, whereas similar outbreaks which occurred previously continued for months. The experience of a number of the larger cities elsewhere has been likewise favorable. We believe, therefore, that the time is now ripe for the Boards of Health of the several states to make appropriate regulations for the finding and controlling of diphtheria carriers in our public schools and similar institutions by the culture method.

*Slack, Arms, Wade and Blanchard—Diphtheria Bacillus Carriers in the Public Schools, Jour. Amer. Med. Assoc., March 19, 1910, Vol. LIV, pp. 951-954.

THE TREATMENT OF ROOMS AFTER DIPHTHERIA AND SCARLET FEVER.

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Read before the Municipal Health Officer's Section of the American Public Health Association, Washington, D. C., September, 1912.

Today a wide variation exists between the ideas of different sanitarians in regard to the treatment of premises after infectious diseases.

Some fumigate after measles and whooping cough, others consider this unnecessary; some pin their faith to formaldehyde, others to sulphur dioxid and still others to fresh air, sunshine and scrubbing.

For years gaseous fumigation has been carried on after infectious diseases, in former times with sulphur dioxid, although at present formaldehyde is more commonly used.

There are many modes of use of formaldehyde among them being,

1. The volatilization of formalin in a generator.
2. The oxidation of methyl alcohol.
3. The spraying of formalin on sheets and allowing it to evaporate.
4. The use of potassium permanganate.
5. The volatilization of solidified formaldehyde.

The methods of use are too well known to need description and all have their advocates.

By the Boston Board of Health the formalin generator was used until January, 1910, when the potassium permanganate method was adopted to be followed in November of the same year by the use of fumigators containing solidified formaldehyde.

Before changing methods at any time careful investigations were carried on to find the comparative value of these, making all tests under service conditions. It was found in some of the tests—no matter what method was used—that test organisms grew from every exposure yet from none of these cases did secondary cases develop.

From the last of November, 1910, until August, 1912, all fumigations with data were kept by one of the writers, who recorded any subsequent cases from that address together with the elapsed time.

During this time 2675 fumigations were made after diphtheria with 48 "secondary" cases or 1.8% and 1748 fumigations with 27 repeat cases or 1.5 % after scarlet fever.

The following table gives the time between the fumigation and the report of the new case.

TABLE I

	Diphtheria		Scarlet Fever
1–3 days	4		3
4–7 "	15		9
1–2 weeks	8		4
2–3 "	6		2
3–4 "	2		2
Over 4 weeks	13 *		7 **
	* 3–33 days	1–53 days	** 1–30 days
	1–34 "	1–54 "	1–32 "
	1–35 "	1–58 "	1–33 "
	2–37 "		1–40 "
	1–48 "		2–42 "
	2–50 "		1–57 "

Let us first consider the new cases after the fumigations following diphtheria:—four occurred during the first three days and a total of 19 during the first week, of this number 15 were sent to a contagious hospital and the fumigation performed within 48 hours of the time of the report of the case, consequently the new case had the exposure to either the same source of infection or the first case itself within nine days preceding the report of the new case. Therefore it would seem quite probable that contact would be more apt to be the cause of the infection than the room which the patient occupied during the short period between the onset of the disease and his removal. The other four cases followed the release of the patient from quarantine after two successive negative cultures on different days and it is a well-known fact that even this does not absolutely rule out the presence of organisms in the nose or throat. During the 2d, 3d and 4th weeks there were but 16 "repeat" cases and of course exposure has been possible during this time.

Over four weeks there were 13 cases from 33 to 58 days but we doubt very much if many would consider that these were due to infection from the room.

It is the intention of the Board of Health to have cultures of contacts if possible in order to lessen the number of "secondary" cases.

The "secondary" cases after fumigations following scarlet fever occurred as follows: 2 within the first three days, a total of 12 within the first week, 8 during the 2d, 3d and 4th weeks, and 7 over four weeks, a total of 27.

Of the 12 during the first week the room was fumigated within 48 hours of the report of the case in 9 instances on the 3d day in one and after convalescence in the other two. Of the entire number 19 were fumigated within 48 hours of the report of the case, 2 on the 3d day, one on the 10th day and 3 after convalescence.

The number of "secondary" cases is raised by having five children in one family taken as follows: Dec. 4th, 1911, fumigated the same day; December 7th, fumigated the 8th; December 8th, fumigated the 12th; December 15th, fumigated the same day and the last one on the 19th. It seems very reasonable to assume that these infections came from persons rather than from inanimate objects.

In order to demonstrate the fallacy of fumigation the Board has since July 4th, 1911 authorized the use of practically no disinfection after diphtheria and scarlet fever, using for each room, no matter what its size, a fumigator which would disinfect not over 500 cubic feet, and it can readily be seen that when this is used in rooms of from 1000–3000 feet no real disinfection would be accomplished.

The householders were instructed to throughly air the room following the "fumigation" and to wash all woodwork.

The results have borne out the contention that fumigation after these infections was unnecessary, 63% of the secondary cases occurring with the smaller amount of fumigation which comprised 57% of the total number after diphtheria and, if we except the family detailed above, 59% of the secondary cases of scarlet fever after the smaller amount of fumigation comprising 61% of the total number.

If the labor of fumigation after diphtheria and scarlet fever would be dispensed with as it has been in many places after measles, and real disinfection carried on after tuberculosis it seems to the writers that much more good would be accomplished and the public would then realize that it is the individual that is the cause of the spread of the acute infectious diseases in the great majority of cases.

REPORT OF THE COMMITTEE OF THE LABORATORY SECTION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION ON STANDARDIZATION OF DISINFECTANTS.

HISTORICAL:

PRINGLE in 1750 attempted to arrest putrefactive processes by the addition of various substances. It is interesting to note that the first systematic but rather crude experiments made for the purpose of determining the relative value of the substance used, were conducted in the presence of organic matter.

BUCHHOLTZ in 1875 conducted an elaborate series of experiments on various elements in the presence of an infusion of tobacco leaves.

BAXTER in 1875 observed that the presence of organic matter required a larger quantity of disinfectant. The test materials which he used were glanders nodules and vaccine lymph.

JALAN DE LA CROIX in 1881 tested the germicidal value of various substances by adding them to beef broth which had been allowed to become contaminated from natural sources.

ROBERT KOCH in 1881 was the first to conduct systematic tests on the germicidal power of disinfectants on pure cultures of bacteria at stated intervals of time. The value of mercuric chloride as a disinfectant and antiseptic was confirmed by his elaborate experiments with anthrax spores dried on silk threads. Koch tested the disinfectants of the time, including carbolic acid and sulphur dioxide. Shortly after the work of Koch emulsified disinfectants made their appearance.

ESMARCH in 1887, using Koch's "thread method," found creolin far superior to carbolic acid as a disinfectant againt emulsions of streptococci and vibrio of cholera, but inferior to carbolic acid in the case of anthrax spores.

HENLE in 1889, using vibrio of cholera and typhoid bacilli confirmed the work of Esmarch, and, in addition, showed that the greater germicidal power of creolin was due to the higher homologues of phenol, namely cresols.

FRAENKEL in 1889, using anthrax spores and the Koch "thread method," showed that the additional germicidal power of crude carbolic over pure carbolic was due to the presence of higher phenols in the former.

BEHRING in 1890 compared the germicidal values of a number of dis-

infectants, using the "thread method" and anthrax spores, anthrax bacilli, typhoid bacilli, vibrio of cholera, staphylococci and streptococci as the test organisms.

GEPPERT during 1889 and 1891 demonstrated that the "thread method" had been overestimated and gave higher results than it should in some cases, due to the carrying over of traces of the disinfectant. This he found in the case of mercuric chloride could be avoided by precipitating the mercuric chloride with ammonium sulphide.

GRUBER in 1891 substantiated the claims of Geppert, suggested further dilution and advanced the idea of adding emulsions of bacteria to the disinfectant.

KRÖNIG AND PAUL in 1897 gave to the scientific world the results of a remarkable series of investigations by a new method known as the "garnet method." They observed that in order to obtain relative germicidal values great care must be taken that such factors as temperature of medication, numbers and species of organisms, media, and absence of extraneous organic matter remain constant. The method consisted in dipping garnets of similar size in an emulsion of anthrax spores. After the films thus obtained had been allowed to dry, the garnets were immersed in the diluted disinfectants. At fixed periods an equal number of garnets were removed from exposure to the disinfectant and washed vigorously in a definite volume of water. When necessary a precipitant was added to prevent antiseptic effects in the sub-culture media. Exact quantities of the wash water were then plated and after incubation the number of surviving spores counted.

This method was the first serious attempt at quantitative germicidal determinations after definite periods of time. Every class of disinfectants was in this way tested under varying conditions and concentrations.

The work of Krönig and Paul marks the beginning of scientific investigation into the fundamental principles of the action of disinfectants as distinguished from the efforts to obtain practical methods for the comparison of values of different disinfectants.

IKÉDA in 1897, stu-lying the results of Krönig and Paul, discovered that disinfection of anthrax spores was a gradual one and proceeded according to a definite formula.

MADSEN AND NYMAN in 1907, using the "garnet method" for the further investigation of the progress of the reaction during the killing of anthrax spores by heat, obtained results which in character simulated a monomolecular reaction. In such a reaction the bacteria would be considered as taking the place of one of the reacting substances and the disinfectant the other.

Madsen and Nyman suggested that anthrax spores and mercuric chloride

be taken as the standard factors and the action of other disinfectants be tested simultaneously under identical conditions.

Chick in 1908 published her extensive investigation on the laws of disinfection. She concludes that disinfection is analogous to a chemical reaction. In the case of anthrax spores disinfection proceeds as a unimolecular reaction. In the case of vegetative forms there is a departure from the simple reaction due to the difference in resistance among the individual organisms.

She points out that disinfection is influenced by temperatures in accordance with the equation of Arrhenius. When phenol or an emulsified coal tar disinfectant is used, vegetative forms show a definite logarithmic relation between the concentration of disinfectant and the mean reaction velocity of disinfection. In the case of metallic salts, the metallic ion is the real disinfecting agent. Mercuric chloride was thought to form a toxic compound with the bacterial cell, which could be neutralized by an excess of soluble sulphide.

Phelps in 1911 in a preliminary paper elaborates further on the theories regarding the applicability of the laws of physical chemistry to the reactions which take place between the test organisms and the disinfectants.

As the theories regarding the laws of disinfection have not yet been thoroughly mastered and made applicable for the practical testing of disinfectants, it is deemed advisable by your committee to recommend the adoption of a standard method which has been shown by actual use in the hands of a considerable number of competent workers to give reasonably uniform results and to await the presentation of further data which would tend to harmonize the adopted method with the present more or less theoretical hypothesis.

Rideal and Walker in 1903 published their well known "drop method" for the standardization of disinfectants. B. typhosus and pure phenol were chosen as the standard factors. The relative germicidal values of disinfectants were expressed as Rideal-Walker phenol co-efficients.

In England this method has come into very general use, and has supplanted the "thread method" and the "garnet method" for practical purposes because of its greater accuracy and convenience in manipulation.

After the appearance of the Rideal-Walker method there was a decided tendency on the part of certain investigators to question the practical results unless the tests were made in the presence of organic matter.

Firth, Macfadyen and Fowler in 1906 suggested the use of a filtrate from an emulsion of feces. Smith and Prausnitz in 1906 suggested a more severe test in the presence of sputum, strained feces, or feces and urine mixed. Sommerville and Walker in 1906 conducted an elaborate series of experiments introducing various kinds of organic matter. Their experiments with feces gave varying results, due to the irregularity in the

composition. In 1907 they suggested standard organic materials in solution such as proteids or gelatines. Blyth in 1906 worked with organic matter both in solution and suspension. Milk was suggested by him as the standard organic matter.

Chick and Martin in 1908 published the results of their investigation of the principals involved in the standardization. Among the important modifications of the Rideal-Walker method which they suggested were determination of the co-efficient at the end of 30 minutes, 20°C. as the temperature of medication and the addition of 3% powdered feces to the disinfectant.

Although the introduction of 3% powdered feces doubled the experimental error its introduction was suggested as a means of meeting conditions under which disinfectants are generally used.

The Lancet Commission in 1909 proposed a modification of the Rideal-Walker method. B. coli and phenol were chosen as the standard factors. The increased number of dilutions, the extension of the time intervals to thirty minutes, the amount of culture and disinfectant transferred to the sub-culture tubes, and the determination of the co-efficient at $2\frac{1}{2}$ minutes and thirty minutes were important modifications suggested by them.

Anderson and McClintic in 1911 published the results of their extensive work on bacteriological standardization of disinfectants.

The hygienic laboratory phenol co-efficient method which they propose has some of the features of the Rideal-Walker method as well as some of the Lancet Commission method, but also contains independent modifications based upon the results of their studies. In their opinion, the original Rideal-Walker method possessed the following objectionable features:

First. The latitude allowed in determining the co-efficient.

Second. Lack of definiteness in the proportion of culture added to the disinfectant.

Third. The latitude allowed in the temperature of medication.

Fourth. The use of seeding tubes 5″ by $\frac{5}{8}$″ with cotton plugs which necessitated their removal from the water bath.

Fifth. The possibility of shaking from the sides of the tube organisms that had not been fully exposed to the action of the disinfectant and thus giving erroneous results.

The Lancet method, although considered a distinct advance over the Rideal-Walker method, possessed the following objectionable aspects:

First. Variations in strains of B. coli communis are known to be greater than those in strains of B. typhosus.

Second. McConkey's bile salt media exerts a variable but none

the less restraining influence on attenuated organisms of the typhoid-colon group.

Third. The method gave no definite rule for decreasing the strength of dilutions tested.

Fourth. Lengthening of the time to thirty minutes appeared to have no very special advantage.

Fifth. The special apparatus required, particularly the spoons, interfered to some extent with the general employment of the method.

After due consideration and investigation of the methods used by the workers mentioned above, your Committee on the Standardization of Disinfectants recommend for adoption as the Standard Methods of this Section, the Hygienic Laboratory phenol co-efficient methods as devised by Doctors Anderson and McClintic and published in Hygienic Laboratory Bulletin No. 82.* The methods there published consist of the original Hygienic Laboratory Phenol Co-efficient Method as first issued by these authors in the Journal of Infectious Diseases, Vol. 8, No. 1. (pages 1–26), in which method no additional organic matter was introduced, and also a modification of this method whereby further definite amounts of organic matter were added. These consist of 1 per cent. of gelatine and 2 per cent. of peptone (pages 27–32). In all instances where the term Hygienic Laboratory Phenol Coefficient Method is used it should be understood that the method employed is the one in which additional organic matter has not been introduced.

The Committee recommend the following elaboration: Under media (page 21 Hygienic Laboratory Bulletin No. 82) instead of the second sentence, insert

"The broth is made as follows:

3 gms. Extract of Beef (Liebig's)
10 " Peptone (Witte)
5 " Sodium Chloride C. P.
1000 c.c. Tap Water.

Boil 30 minutes, make up loss by evaporation, titrate and adjust to + 1.5. Boil 15 minutes, make up loss by evaporation, titrate and adjust if necessary."

Your Committee also desire to make recommendation concerning the question of the cost of a disinfectant per unit of disinfecting efficiency as

* Bulletin No. 82, Hygienic Laboratory, U. S. Public Health and Marine Hospital Service, Washington, D. C., 1912.

compared with pure phenol. This subject was presented by Drs. Anderson and McClintic in Bulletin No. 82, Page 32.

Your Committee desires to recommend the utilization of this procedure, but believes that the method of determining the cost of a disinfectant by its unit of disinfecting efficiency should be applied with a full understanding of the results which will be obtained thereby.

Merck's Silver Label Phenol is recommended in Bulletin No. 82, Page 22, as the standard phenol. It has been found however, that phenols vary in the amounts of cresols and the higher phenols which they may contain.

The following procedure has been used in England for the purpose of eliminating these higher phenols and cresols on the one hand, and any accidental contamination of the phenol with water on the other. While the Committee have no specific data in any amount to warrant the recommendation of this procedure, it would be advisable for those who desire to apply the Hygienic Laboratory Phenol Co-efficient Method under conditions of the greatest refinement to purify the standard phenol in the following manner:

Merck's Silver Label Phenol should be distilled fractionally. The first third which will contain water, is discarded, the last third which may contain cresols and the higher homologues of phenol is discarded and the middle third which should contain neither is used in making up the 5% stock dilution.

Since the publication of Bulletin No. 82 comparisons of the results of tests made by different members of the Committee upon duplicate samples have led to the belief that further studies may develop points of value in the further elaboration of the method which will tend to produce greater uniformity of results in the hands of different workers.

The variability in the resistance of even the same culture when grown under apparently identical conditions appears to be an important factor in any attempted explanation of the different results obtained on duplicate samples.

The variability in resistance may be due to some vital alteration of individual organisms through processes of natural selection or may merely be due to greater or less numbers of the typhoid bacilli present in the standard volumes of culture used in the test.

One member of your Committee has found that the following manipulation of the stock culture gives a test culture of even resistance.

The culture of B. typhosus (Hopkins) is obtained from a 30 day at 20°C. stock culture on standard infusion agar. Transplants are made at intervals of 24 hours in the usual manner. On the third day the culture thus obtained is used and discarded. This method necessitates the transplanting of a new stock culture and three different cultures in extract broth

every 24 hours. The temperature of incubation should not vary over .2°C. if concordant results are to be obtained.

One of the members of your Committee also suggests that the following concise systematic procedure be printed as an additional aid to beginners and as illustrating the fact that certain detailed procedures in the application of the method can be subjected to variation without disturbance of the important factors which make for uniformity of results.

CONVENIENT METHOD OF PROCEDURE FOR HYGIENIC LABORATORY PHENOL CO-EFFICIENT METHOD:

DILUTIONS. As most disinfectants used have a co-efficient of 1 or over, it is usually expedient to make a stock dilution of 1 : 100. This is done by adding 1 c.c. of the disinfectant to 99 c.c. of sterile distilled water, or adding 5 c.c. of the disinfectant to 495 c.c. of water. The simplest procedure is to use graduated stoppered cylinders or stoppered flasks with one mark graduations of 100 or 500 c.c. capacities and to partly fill same with sterile distilled water. The disinfectant is then added, using a capacity pipette and washing same out until all of the disinfectant has been transferred to the water and water added to the full capacity called for. This is the stock dilution and is used in making the higher dilutions. In testing disinfectants that have a less co-efficient than 1, a 1 : 20 dilution is used as the stock dilution.

A sufficient number of glass stoppered bottles which have been sterilized with lead foil over the tops are now numbered with a wax pencil to correspond with the numbers which have been placed opposite the dilutions on the list of same which has been prepared at the time of planning the test. Sterile distilled water in flasks, closed with lead foil, is placed conveniently in reach. Delivery pipettes of several sizes which have been sterilized in rectangular copper boxes or bibulous filter paper come next.

The necessary amount of water to make the desired dilutions is now transferred from the flasks of sterile distilled water to the bottles by the use of sterile delivery pipettes and the stock dilution added. (See table for dilutions pages 23, Bulletin No. 82.) If 4 dilutions of phenol are used in the test, the strongest dilution of the disinfectant being tested would be No. 5, as it is considered better to run the phenols first. All of the dilutions are well shaken, and then are ready to be placed in the seeding tubes at the time of starting the test.

ARRANGEMENT OF SUB-CULTURE TUBES. A test tube rack of 6 rows of 12 holes each, or 2 racks, each containing 3 such rows may be used for the sub-cultures. If the test be of 10 dilutions, 60 tubes are numbered in notation and placed in the rack on rows of 10 tubes each; and if the test embraces 12 dilutions 72 tubes of broth are numbered and arranged in

rows of 12 each. These are placed within convenient reach of the worker's left hand.

Arrangement of Bunsen Burner. A burner to which a fan tail has been affixed is led preferably from the left and back of the bench to the center and front with a little tubing to spare.

Loop Rack. If made of wood this rack may consist of 4 strips approximately 4 inches wide, so joined that the top shall be about 10 inches high and 9 inches long, and grooved to hold loops at intervals sufficiently large to admit of easily withdrawing the loops. There should be about 6 or 7 grooves. The bottom of the rack should be 2 inches longer than the top to give stability, which will give the sides or ends considerable slant. The rack is placed close to the front of the bench, almost at right angles, with a slight slant to the right and away from the worker, and in front of his right shoulder.

Loops. Loops of 4 mm. inside diameter, 4 in number, which have been bent at the junction of the loop and standing end of the wire at right angles with the latter are placed in the loop rack.

Inoculations. The inoculations are made with an apparatus arranged according to Rosenau's method of measuring minute quantities. A pipette of very small bore, graduated in tenths of a c.c. can be made to deliver six tenths of a cubic centimeter without being too large.

The pipette in its holding apparatus should be placed at the right of the worker, so that he can push the loop rack away from him and draw the inoculator toward him; and, when through inoculating, reverse the action, sliding the inoculator away from him diagonally to the right, and drawing the rack directly toward him.

Water Bath. The water bath consists of a wooden box about a foot and a half square and as deep, containing a three or four gallon pail from which the bale has been removed and packed around with sawdust. It is a good plan to raise the box about six inches more by putting strips and casters upon the bottom. It can then be pushed easily under a bench when not in use, and as easily withdrawn, and is high enough to enable the worker to readily reach the tubes when in use. During the test the water bath is placed at the right of the worker.

Seeding-Tube Holder. A convenient method of making a container for the seeding tubes is as follows: Cut down an oblong wire test tube basket to about 2½ inches in depth and fit the top thereof with a piece of half inch wood, through which three rows of 6 holes each have been bored; the holes being made of a size to fit the seeding tubes loosely.

Adjustment of the Seeding-Tube Holder. An ordinary tripod can be used to support the seeding-tube holder in the water bath. It may be necessary to cut off an inch or two of each leg of the tripod in order to

support the seeding-tube holder at the proper depth in the water; that is so that the top is a little above the surface.

Culture. A 24 hour culture of B. typhosus, (Hopkin's) is removed from the incubator and filtered into a sterile test tube, using a sterile funnel of suitable size and sterile filter paper. (S. & S. No. 604).

Technique. The seeding-tube holder is carried to the place where the dilutions stand waiting, and seeding tubes to the number required are placed therein, being removed for that purpose from a small square wire basket in which they have been sterilized by dry heat; said basket being filled with tubes, closed ends up and then wrapped in paper as a protective measure. 5 c.c. of each dilution is transferred to its numerical seeding tube by the use of sterile 5 c.c delivery pipettes, a separate pipette being used for each dilution. The filtered culture is placed in an unoccupied hole in the seeding tube holder which is placed in the water bath, and the worker takes his place to run the test.

The test is not started until an interval of time sufficient for the culture and disinfectant to reach the same temperature as the water bath (20°C.) has elapsed.

The Test:

Flame the loops.
Push Bunsen Burner and Loop Rack directly from you.
With right hand draw up inoculator.
Fill the pipette from the test tube containing the filtered culture.

At the beginning of the 5 or 2½ minute interval (by a timepiece with a second hand which can be arranged to suit the worker) the first seeding tube, which is the one at the left end of the row nearest the worker, is inoculated with 1-10 c.c. of culture and each seeding tube in its numerical order is inoculated, the work being continuous. It is desirable to do the work with the end in view of making the natural break in this part of the work, which is occasioned by the emptying of the pipette and subsequent refilling, as little discordant as possible.

When all of the seeding tubes have been inoculated, the Inoculator is pushed away diagonally to the right, the loop-holder is drawn up to the edge of the bench in the position already described, the timepiece is again consulted and just before the expiration of the 2½ minute interval the loop furthest from the worker is taken in the right hand, the subculture tube numbered "1" is withdrawn with the left hand, the plug of the tube is withdrawn either with third and fourth fingers or with the fourth finger and the palm of the hand, the loop is dipped perpendicularly into the first seeding tube and as the 2½ minutes expire the transfer is consummated; the loop is replaced in the groove next toward him from the nearest loop with

one move, the right hand is lowered and put through the rack, the burner taken hold of; the inoculated subculture tube in the left hand is given a rapid shake, replaced, the next one simultaneously withdrawn, and as the worker's eye naturally travels back toward the loop rack the Bunsen is placed accurately under the last used loop and the furthest one selected for the next transfer.

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Committee:

E. B. Phelps, *Chairman.*
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BOOK REVIEWS.

Principles of Microbiology. *A Treatise on Bacteria, Fungi and Protozoa Pathogenic for Domesticated Animals. By Veranus Alva Moore, B. S., M. D., V. M. D. pp. 506+XI. Ithaca, N. Y., Carpenter & Co., 1912.*

The appearance of a volume from the pen of Doctor Moore is sure to be hailed with pleasure by bacteriologists throughout the country who know of his splendid work in the Bureau of Animal Industry and especially as Director of the New York State Veterinary College at Cornell University. This is the second volume to appear in this country bearing the name "Microbiology" and offers additional evidence that the so-called bacteriologist of the present day cannot confine himself to one group of micro-organisms, but must familiarize himself with the broader field which has been opened up during the past ten years.

Professor Moore's book, as indicated in the preface, has been prepared as a text book for his students in veterinary science, and primarily for those beginning the study of Microbiology. Its purpose is to point out the place and role of micro-organism in nature, to give the methods for their study and identification, to indicate the relation of certain species to animal diseases, to describe the more important of these pathogenic species and to show the reactions of the tissues toward the invading organism in the establishment of immunity.

The book may be divided, naturally, into three parts, the first of which, comprising the first eleven chapters, deals with general behavior of the bacteria and the methods for their study and control in the laboratory. The second part comprises chapters XII to XXII and deals with the bacteria and protozoa in relation to disease, particularly the species pathogenic for domestic animals, while the third part of the book takes up the general subject of bacterial products, tissue reactions, the use of sera in diagnosis, immunity and vaccine therapy.

The first section of the book presents a very concise historical sketch of the development of bacteriology, followed by a discussion of the bacteria in nature in which the most important facts are presented. The morphology of the bacteria is next considered and the subject is presented in a very direct and clear manner. One might perhaps question whether in Fig. 2 some of the so-called higher bacteria did not actually belong to the group of Hyphomycetes rather than the Chlamydo-bacteriaceae. Under the classification of bacteria and the identification of the species, specific directions are given for the student and descriptive charts and subdivisions are introduced to make the subject more clear. The descriptive chart of the Society of American Bacteriologists is introduced in full.

Under bacteriological apparatus, the ordinary and many special kinds of appliances are described. The subject of sterilization and disinfection is briefly, but very thoroughly discussed, definitions being supplied for the terms which the student would meet for the first time and careful descriptions of certain disinfectants, their proper uses and their limitations are presented. This makes a chapter of very great practical value. A chapter upon the preparation of media for the cultivation of bacteria gives detailed methods for the preparation of many kinds of culture media which the student or investigator might use, and this with the complete directions for isolation, cultivation and examination of bacteria which follow, make the book of the highest value as a text or reference book for the laboratory. Chapter XI deals with the difficult subject of the vital activities of the bacteria, and the most essential facts are concisely presented. In the discussion of chromogenesis no mention is made, however, of the important work of Sullivan upon this subject. The fundamental subject of fermentation deserves somewhat more detailed discussion than is here accorded it. On notes, also, a little looseness in the descrip-

tion of the properties of ferments and in examples of their action. On page 148 in the reaction expressed between urea and water a typographical error is noted, and on page 152 two other typographical errors, more serious in character, may be pointed out where the author uses the names of Barrie and Stulzer in place of Burri and Stützer and Bacillus radiocola in place of Bacillus radicicola.

In the discussion of formation of gas from sugars, one might also suggest that some consideration be given to the very important work of Longley and Baton which fails to be mentioned here. As is to be expected, the second part of the book, dealing with the relation of micro-organisms to disease, is most excellent. After pointing out the general methods of infection in animals, the author guards the student against the assumption that a microbe pathogenic to one animal must necessarily be pathogenic to another, and under the general head of "Experimental Animals" makes the following statement which it seems to the reviewer is worth quoting here, and should be thoroughly impressed upon every bacteriologist, whether undergraduate or in professional work:

"It is important to keep in mind, however, that because a certain species of bacteria proves fatal to a guinea pig, it cannot be assumed that it is pathogenic for other species of animals. The conclusion cannot be drawn that because one species of animals succumbs to a given organism this organism will prove fatal to other species of animals. Many errors relative to the identity of certain diseases affecting man and the lower animals have been made because of the results of the inoculation of a given animal with the bacteria from different sources have given apparently identical results."

This point is emphasized because of the tendency in certain quarters to depend upon the animal test as a means of proving the dangerous and toxic property of micro-organisms in general.

Bacteria in relation to water and milk supplies are given a brief consideration in this volume. It is rather unfortunate that reference to the report of the Public Health Association Committee on Water Analysis could not have been made to the Report of 1912 rather than to that of 1905, but the later one had presumably not appeared when the book went to press. The importance of milk as a means of transmitting disease is emphasized but it seems to the writer that the importance of the germicidal action of freshly drawn milk is over-estimated and is likely to lead to a false sense of security. If there were actual germicidal action due to milk this should be shown in greater proportion at the higher temperatures than at the low temperatures, which is not the case.

Coming, now, to the more detailed discussion of particular families of bacteria, we find an extensive and most valuable discussion of the Coccaceae and of the Bacteriaceae in their relations to animal diseases. The writer knows of no other treatment so brief and at the same time so clear, concise and comprehensive. The different genera in each of these families is taken up and the species under these genera considered separately with reference to the particular disease caused by it. In each case the synonyms for the organism are given and a description of its place in nature and general occurrence, morphology, staining reactions, methods of cultivation and life conditions and properties, and a consideration of its pathogenesis. This puts in a very definite way the exact relation existing between specific organisms and specific diseases and gives to the student, or general reader, exact information in place of the vague general statements which are more commonly met. This portion of the book, which if by far more than half of it, is deserving only of the highest praise.

In a similar manner the author discusses the higher bacteria and fungi pathogenic for animals and presents the important determined facts up to the present time.

Coming now to the general subject of the Protozoa, we find a historical sketch of the knowledge of the protozoa with relation to diseases, a discussion of the life cycles of various types of protozoa, methods for their cultivation and their classification. The important species, for which there has been worked out a definite relation to particular diseases, are described in detail, following the

same system which is used for the different types of bacteria. By this means, a subject which has been more or less cloudy, because of its rapid development and the mixture of hypotheses with observed facts, is here presented clearly and definitely. Under this general heading of the protozoa are included the Flagellata, Trypanosoma, Spirochaeta, Sarcosporidia and Coccidia. A full account of the Negri bodies is also presented.

A short chapter presents clearly the facts relative to diseases caused presumably by filterable viruses, or in which the germ still remains unknown. Chapter XXIII describes the specific bacterial products of importance in a consideration of serum production, toxine production and reaction upon living organism. The general method for the production of antitoxins is also treated, while Chapter XXIV discusses clearly the subject of the serum diagnosis.

The book ends with a chapter on Immunity and Vaccine Therapy, in which the older theories on immunity are described and the more modern ones explained. Special importance is given to the subject of vaccines and their preparation and use.

The book impresses the reader of its thoroughness, the careful selection and balancing of material and the accuracy of statement and freedom from theorizing.

The makeup of the book is good, typographical or proof-reading errors are few and the type is clear, but a less highly calendered paper would render reading less wearisome to the eyes.

In spite of this and the very insignificant criticisms made as to the first part of the book, the volume constitutes a marked contribution to microbiological science as a whole, and especially in its relation to animal diseases. *S. C. Prescott.*

Milk and the Public Health. *William G. Savage, The MacMillan Co., New York.*

Good milk literature is altogether too meagre. When one contemplates the magnitude of the milk industry and the immense growth of scientific interest and of public interest in the milk question in recent years the scarcity of books on the subject of milk is astonishing. These facts and the present agitation concerning the relation of milk to the public health makes a publication under the above title most timely. W. G. Savage is the Author of a book on the "Bacteriological Examination of Water," which is recognized as authoritative. In the present volume he writes with the same style of authority based on long experience as a medical officer of health. He has divided the book into three parts:—

Part 1. The bacteriology of milk: Milk and Human Disease.

Part II. Bacteriological Examination of Milk.

Part III. Public Health Control of the Milk Supply.

In part I the author thoroughly discusses the sources of milk infection and milk born diseases and includes the most recent knowledge regarding bovine tuberculosis and udder inflammation of cattle with a chapter on infant mortality.

Part II is devoted to laboratory tests of milk for bacteria. The value of each of the routine tests is discussed and the standards which have been suggested by all authorities. The author quotes freely from American milk literature.

Part III deals with control of the supply by sanitary inspection and by legal restriction. There is a chapter on Certified Milk and on Pasteurization.

As a whole the book is a most excellent summary of the more recent information on milk matters. It is well worth the price and should find a place on the bookshelf of milk dealers, laboratory workers and health officers.

Charles E. North.

PUBLIC HEALTH NOTES.

Poliomyelitis (Infantile Paralysis).

"Prof. M. J. Rosenau, of Harvard University, announced at a meeting of the Fifteenth International Congress on Hygiene and Demography at Washington, September 26, that he had apparently succeeded in transmitting poliomyelitis (infantile paralysis) from sick to well monkeys by the bite of the common biting fly, *Stomoxys calcitrans*. He allowed a number of these flies to bite monkeys sick with poliomyelitis in various stages of the disease and then later allowed these same flies to bite 12 well monkeys. Of the 12 well monkeys thus bitten 6 became sick with well-marked symptoms of poliomyelitis, and of these, 3 died. Three of the 6 monkeys thus infected had diarrhea and symptoms of enteritis during the course of the illness.

"The *Stomoxys calcitrans* resembles in size and appearance the common house fly. It is most frequently found in and around stables. It is, however, by no means uncommon in houses. It bites animals as well as man, and sucks their blood, upon which it feeds.

"Dr. Rosenau concluded from his experiments that, after the virus of poliomyelitis is taken in to the body of the fly by biting an infected animal or person, some time must elapse before the fly is capable of transmitting the disease, and that the period which must thus elapse is probably less than 21 days."

Public Health Reports, Vol. XXVII, No. 39.

The Outbreak of Poliomyelitis in Buffalo.

"During the week ending August 24, 1912, there were reported by the city health authorities 34 cases of poliomyelitis, with 3 deaths, and the following week, 26 cases with 2 deaths. The total number of deaths up to August 31st numbered 23. The slight decrease in the number of deaths reported gives some ground for the expectation that the epidemic will soon be under control, but it is the opinion of those who are investigating the outbreak that no prediction to this effect is warranted as yet. The commissioner of health of the State of New York reported, August 29th, 9 additional cases in the vicinity of Buffalo, and 6 cases have been reported in the neighboring city of Jamestown."

New York Journal, September 21, 1912.

The Epidemiology of Bacillary Dysentery.

Dr. C. J. Hunt, Associate Chief Medical Inspector of the Pennsylvania Department of Health, has recently reported the results of studies of water-borne bacillary dysentery in that state. After discussing the history of this disease in Pennsylvania, the types and pathogenicity of organisms involved, the season and age at which outbreaks are commonest, and the relation of the disease to typhoid fever, Dr. Hunt expresses his conclusions as follows:—

"1. Bacillary dysentery should always be a reportable disease.

"2. Sufficient power should be given to the health authorities to investigate and abate any suspected source.

"3. Less confusion to the general practitioner results from a nomenclature broad enough to include all types of the causative organism.

"4. While there is some warrant for the terms 'dysentery' and 'paradysentery,' the more general one of 'bacillary dysentery' in so far as preventive medicine is concerned, simplifies the problem both of diagnosis and of sanitary supervision.

"5. There is apparently a notable lack of recognition of the etiology and probably of the pathology of cases infected by members of the dysentery group, resulting in a longer continuance of the infecting source and a higher mortality; this is evidenced in the varied diagnoses such as 'diarrhea,' 'winter cholera,' 'intestinal grip,' 'grip,' 'gastric fever,' 'intestinal disorder' and many others.

"6. Dependent on the casual association of the *B. typhosus*, outbreaks of bacillary dysentery may be followed within ten to twenty-one days by a marked increase in the

number of typhoid fever cases. This occurred in five out of nine instances in Pennsylvania and may serve as a warning of the presence of the more serious infection; the immediate abatement of the sources would probably decrease the morbidity and mortality due to typhoid fever.

"7. When it is recalled that the major number of cases of bacillary dysentery are mild in form, being caused by Types 2 and 3; that sporadic cases probably exceed the total numbers occurring in epidemics; that sporadic cases probably account for the large proportion of deaths under 2 years of age accounted for statistically as cholera nostras, dysentery and diarrhea and enteritis; that the disease is reportable in only seven states and territories; and that in the latter the law is not enforced, the only conclusion is that we have no definite collective information about the morbidity and mortality of the infection which properly should be called dysentery."

Journal of the American Medical Association, September 21, 1912.

Bacteria Carried by the Common House Fly.

The part played by flies in the transmission of disease has received experimental investigation during the past summer at Liverpool, England. Flies were caught in specially designed traps in various districts of the city, and in various kinds of shops and dwellings. Some of the flies were then allowed to swim in a sterile fluid for different intervals and the number of bacteria washed off was estimated, while others were pounded up in order to determine their entire bacterial content. Determination of the species of bacteria found was also carried out.

The results of the work, which was carried out under the direction of Dr. E. W. Hope, M. O. H., are summarized as follows:—

"1. The number of bacteria coming from house flies whilst struggling in liquid may be very large, varying from 2,000 (the lowest figure) in five minutes, to 350,000 (the highest figure) in 30 minutes. This number may be taken as a measure of their capacity to pollute liquid with their vomit or excrement, or by wallowing in it. The number of bacteria carried inside the fly is very much greater.

"2. Flies caught in either congested or insanitary areas of the city carry far more bacteria inside and outside than those from the more sanitary, less congested, or suburban areas. The number from the former varied 800,000 to 500,000,000 per fly, and from the latter from 21,000 to 100,000.

"3. The number of intestinal bacteria and bacteria likely to be harmful is larger in flies caught in the insanitary areas.

"4. Flies caught in milk shops apparently carry and contain more bacteria than those from other shops with exposed food in a similar neighbourhood. The reason of this is probably because the milk, when accessible, especially in the summer months, is a suitable medium for bacteria, and the flies first inoculate the milk, and later re-inoculate themselves, and then more of the milk, and so establish a vicious circle.

"5. On one occasion the number of bacteria, carried by house-flies caught in an eating-house opposite the abattoir, was compared with those carried by blue-bottles. The latter, as might be expected, was far larger.

"6. In cities where food is plentiful flies rarely migrate from the localities in which they are bred, and consequently the number of bacteria they carry depends upon the general standard of cleanliness in that locality. This is well indicated by the fact that flies caught in a street of modern, fairly high-class workmen's dwellings, forming a sanitary oasis, in the midst of a slum area carried far less bacteria than those in an adjacent neighbourhood.

"7. As the amount of dirt carried by flies in any particular locality, measured in terms of bacteria, bears a definite relation to the habits of the people and the state of the streets, it demonstrates the necessity of efficient municipal and domestic cleanliness, if the food of the inhabitants is to escape pollution, not only with harmless but also occasionally pathogenic bacteria.

"8. It is clear that flies from the suburbs where infantile diarrhœa is rare carry far less bacteria than those in the city, where it

is common. It was, nevertheless, impossible, in the time at our disposal, to correlate exactly the number of varieties of bacteria carried by flies in the city with the number of cases and deaths from infantile diarrhoea in individual streets.

"Dr. Hope states that the full report, with maps, diagrams, etc., will appear in the *Journal of Hygiene*."

Medical Officer, September 7, 1912.

The Isolation of Scarlet Fever.

"Although the treatment of scarlet fever by isolation in institutions has without doubt had the effect of reducing the death-rate from that disease, there is little or no diminution in its general incidence, a fact which is the cause of much concern among public health administrators. A few years ago there was a strong agitation in favour of the curtailment of hospital isolation in the case of scarlet fever owing chiefly to the practice having been discredited in consequence of the frequency of the number of 'return' cases. Instead, however, of condemning these institutions altogether, medical officers of health and medical superintendents set themselves the task of ascertaining the cause of the prolonged infection which brought about 'return' cases. As a result, it is now very generally recognized that a convalescent patient may become in a sense re-infected from an acute case and that during the last few weeks of the illness such patient should be kept apart from those in the early states of the disease. This view was emphasised by more than one speaker during a discussion of the subject which took place at the Liverpool meeting of the British Medical Association. Dr. C. H. Phillips, who has had a large experience as the medical superintendent of the Bucknall Isolation Hospital of the county of Stoke-on-Trent, insisted that patients should not be massed together in large wards but classified and segregated. Where, he said, the germs of disease are practically living in the respiratory passages and given off by every breath, patients must of necessity infect each other and mild cases become contaminated with severe case and complications of all sorts arise. Each patient should be treated as likely to be dangerous to his neighbour and thoroughly isolated, then mild cases could be more readily discharged from hospital and the cost of maintenance lessened. Dr. Phillips advocated the more general outdoor treatment of cases of scarlet fever. If the patients were warmly clad he considered that the more time they spent in the open air the better it would be for them. We believe that this is becoming more and more the practice among those in charge of fever hospitals, and Dr. Leslie Rundle, of Liverpool, declared that he was in the habit of treating scarlet fever in a similar way to tuberculous cases. Our readers will also remember a recent article in these columns by Dr. Philip Boobbyer, descriptive of the open-air methods of treatment so successfully practised during the last fifteen years at the Nottingham City Fever Hospital."

The Medical Officer, August 31, 1912.

Epidemic of Icterus.

"An interesting report of an epidemic of icterus comes from Elisabethgrad in South Russia. The textbooks pay very little attention to the epidemic character of the disease, and the only good authority on the question is Hennig, who in 1890 collected from the available literature reports from eighty-six epidemics. Dr. S. Weissenberg gives a review, in the *Deutsche, medizinische Wochenschrift* for August 1, 1912, of forty-four cases of icterus which occurred from July 1909, to November, 1910, that is, the epidemic spread over seventeen months, reaching its maximum during the months of October and November, 1909, then falling off, until the same two months of the following year again showed a large increase. From this fact the author concludes that the infectious form of icterus appears only in the fall. As to sex, it was noted that women were more easily attacked than men, and that adults had more cases than children and adolescents. The epidemic was observed not only in the city of about 75,000 inhabitants, but in the surrounding country. Rarely the disease started suddenly, with a slight chill and vomiting and a few hours

later icterus developed; usually the patient complained for three days of headache, nausea, and loss of appetite, and icterus appeared between the third and fifth day. Coincident with the appearance of icterus the liver and spleen became painful and sometimes the kidneys were also attacked. Itching of the skin and slowness of pulse which usually accompany icterus were also found in these cases. The temperature only very seldom deviated from the normal. The average period of the attack was about fourteen days, and the attack itself was slight, but tended to recurrence. Only one patient died, but it is doubtful if icterus was the cause."

New York Medical Journal, September 14, 1912.

Trachoma.

"Trachoma has been found by officers of the United States Public Health Service to be prevalent in certain localities in Kentucky and on Indian reservations in Minnesota. Trachoma is a disease affecting the eyes, is chronic in nature, and mutilating in its course and results, frequently producing partial or total blindness. The disease is common in parts of Asia and southern Europe. Immigrants suffering with this disease are not allowed to enter the United States. Recent reports indicate that trachoma is also present in Chile, where it appears to be spreading. Many cases have been noted in Valparaiso. The disease is most prevalent in localities where the hygienic conditions are bad and in those sections of cities where there is marked congestion and overcrowding. The disease has undoubtedly been imported into Chile by immigrants coming from localities where it is endemic."

Public Health Reports, Volume XXVII, No. 37, September 13, 1912.

Deodorizing Sewer Air at Winnipeg.

"The efficiency of the Beeman sewer deodorizing machine has been reported on by Col. H. M. Ruttan, City Engineer of Winnipeg, Canada. In this machine wood alcohol vapor impinges upon a platinized porcelain disk which is maintained at a cherry red heat, the alcohol being oxidized to formaldehyde. Ten machines were installed in Winnipeg in 1910 and in the present report it is set forth that while they are efficient as deodorizers, they have no bactericidal action, (nor is any required), and that the cost of operation is about fifteen cents per machine per day. These machines are installed in sewer manholes, and sufficient formaldehyde is generated to deodorize the gases and vapors arising thereform. Figuring that there should be not less than one deodorizing machine to every three manholes, the International Sanitary Company of Winnipeg has given the city a proposition for eight hundred machines, the total yearly cost of maintenance of which would be approximately thirty thousand dollars. As a matter of fact the city has contracted for fifty additional machines."

Engineering Record, Vol. 66, No. 11, September 14, 1912.

Reporting of Industrial Accidents.

Those interested in the study and prevention of industrial accidents and more particularly in the framing of regulations for the reporting of such accidents may read with much profit the paper of Doctor Robert E. Craddock of Columbia University in the June publication of the American Statistical Association.

The problem Doctor Craddock has set himself is to show what is being done in accident reporting in the various states at present, and to consider how far these present attempts meet the problem and in how far still other facts should be reported.

Among the problems in accident statistics prominence is given to: 1, "Relation of Fatigue to Accident;" 2, "Experience of the Injured;" 3, "Nature and Reduction of the Disability;" 4, "The Mechanical Causes of Accidents and Nature of Injury by Industries;" 5, "Sex, Age and Conjugal Condition of the Injured."

Doctor Craddock emphasizes the need of a greater uniformity in schedules, more complete data, and a uniform scheme of record and presentation.

Quarterly Publication of the American Statistical Association, New Series, No. 98, June, 1912.

Is Dispensary Treatment Effective?

With the increased demand for more efficiency in all lines of industry, it is but natural that a similar movement should begin to have vogue in social work. Michael M. Davis, Jr., recognizes this fact in a recent article on "Efficiency Tests of Out-Patient Work" in the Boston Medical and Surgical Journal. Dr. Davis, who is Director of the Boston Dispensary, has attempted to obtain a basis for ascertaining whether the average clinic really gets value received for the money it spends. He asserts with justice that the oft repeated cry of "abuse" in dispensary treatment can never be verified until accurate statistical investigations among the patients who come to these out-patient departments have been made.

With this idea in mind, Dr. Davis selected 116 patients at random and studied them from the point of view of the latest scientific social methods. Some of the results obtained are of interest. The economic classification showed that 56% of the patients were in the grades of unskilled labor or below; 28% in the skilled labor groups; and 14% in the clerical or professional groups. This factor, however, is not the only criterion of eligibility for dispensary treatment. "The members of the family of a clerk earning $18 a week with six young children may be more suitable subjects for medical charity than an unmarried laborer earning $12", says Dr. Davis.

In the study of housing conditions, it was found that only 16 of the 116 patients were living alone, and that for 30 patients the housing status could not be obtained because of wrong address or for some other reason. Out of 61 patients classified according to persons per room, it was found that in 32 cases there were from 1 to 1½ persons per room; in 11 there were from 1½ to 2; in 3 cases there were 2 or over. In 15 cases there were from ½ to 1 person per room.

In the cases of 93 patients where reasons for coming to the dispensary were ascertained, 33 were "suggested by a friend"; 24 "had relatives who were or had been patients at the dispensary"; 10 had been patients at previous times; 9 were sent by school physician or school nurse; 5 were sent by private physician; 3 "lived close by"; and 4 "had often heard of place."

As to the medical resources of the patients, 41 out of 57 cases in the unskilled labor group had always depended only on medical charity and of the remaining 16, only 3 had ever employed a private physician. In the skilled labor group, out of 37, nearly one-half, 17, had depended only on medical charity and 5 had employed a physician as a frequent resource. In the clerical group, 6 had been continuously unable to employ a physician while the same number had employed one on occasion.

As to the medical results, out of 102 cases where information was obtainable, 61% continued treatment until they were cured, relieved or improved; 33% stopped their visits before completion of treatment; and the remainder either did not improve under continued treatment, or their cases were still pending at the time when the statistics were compiled.

Dr. Davis recommends much more extensive study on this same basis of all dispensaries, and the careful following up in the homes of all cases by the social worker to insure increased efficiency in treatment.

Will Direct Surveys and Exhibits.

The organization of the New Department of Surveys and Exhibits of the Russell Sage Foundation marks a significant advance in social work, and one in which public health workers should be particularly interested. The new department will act as a clearing house for ideas and suggestions on local surveys and also on exhibition campaigns. The detailed plan of action has not yet been fully worked out. In general terms, it will be to define and spread the social survey and exhibit idea and to stimulate its use; to collect and keep within easy reference reach, through pamphlets, reports, photographs, drawings, miniatures and models, information on the best survey and exhibit experience that has been gained thus far; to build up an agency for assisting communities to organize surveys and exhibits; to help in the preliminary diagnosis to determine the

major investigations of the survey; to advise in the methods of using exhibits; to help localities to get in touch with material for and directors of exhibits; and to put communities in touch with social surveyors who could be secured to go forward with the studies from the point where the preliminary diagnosis stops. Moreover, with regard to exhibits, it will have a record of cost for services, together with the means toward economy, the places to get materials, where exhibits may be rented, what rental rates are, the cost of photographs, and so on. Another of its functions will be to develop new ways of representing facts that they may be better understood by the many who are not much impressed by statistical tables or who will not translate columns of figures into terms of common experience. The department will not have sufficient funds for sending members of its staff into communities for long periods of time to make surveys or prepare exhibits, but will, to some extent, be able to send representatives for shorter visits to assist in planning and organizing the local projects.

Its director, Shelby M. Harrison, has had wide experience in survey and exhibition work in connection with the Pittsburg Survey and similar movements in Syracuse, Birmingham, the Western Pennsylvania Coal fields and elsewhere. The Associate Director, E. G. Routzahn has for seven years directed one of the traveling exhibits of The National Association for the Study and Prevention of Tuberculosis, and is thoroughly familiar with the technique of exhibition, organization, construction and demonstration. A departmental committee has been organized which will be in close touch with the new work. The members of the committee follow:—Miss Mary E. Richmond, director Charity Organization Department of the Russell Sage Foundation, chairman; Leonard P. Ayres, associate director, Department of Child Hygiene, Russell Sage Foundation; Dr. Livingston Farrand, executive secretary, National Association for the Study and Prevention of Tuberculosis; John M. Glenn, general director, Russell Sage Foundation; Paul U. Kellogg, formerly director, the Pittsburg Survey and Francis H. McLean, general secretary, American Association of Societies for Organizing Charity.

The new department has already issued a pamphlet entitled "The Social Survey" which is of value to anyone engaged in this work. It contains articles by Paul U. Kellogg, Mr. Harrison, Dr. George Thomas Palmer, Miss Pauline Goldmark, and Prof. Edward Chaddock. Office headquarters were opened on October 1 at 31 Union Square, New York City, from which point the department will be glad to co-operate with local and national organizations.

Prevention of Infant Mortality.

The third annual meeting of the American Association for the Study and Prevention of Infant Mortality was held in Cleveland October 2 to 5. The program was divided into the following sections: Birth Registration; Educational Prevention of Infant Mortality; Eugenics; Housing in Relation to Infant Mortality; Midwifery; Nursing and Social Work; and Prevention of Municipal Infant Mortality. Each section of the program was in charge of a selected committee, and the papers were varied and interesting. The exhibit of the association at the recent Congress on Hygiene and Demography at Washington will be used as a traveling exhibit.

Conservation of Health.

Health and disease prevention were given especial attention at the Fourth National Conservation Congress held in Indianapolis, October 1st to 4th. The economic loss from preventable diseases and how this loss might be checked and the resources of the community conserved were discussed by experts from various points of view.

Physical Defects of School Children.

"Of the 20,000,000 children in this country not less than 75 per cent. need attention for physical defects which are prejudicial to health and which are partially or completely remediable." This is the result of the findings of Dr. Thomas Wood, Professor

of Physical Education in Teachers' College, Columbia University, and published for free distribution by the United States Bureau of Education. Dr. Wood estimates that at least 15,000,000 school children now in attendance in the schools of the United States need a physician's attention and that of this number 1,000,000 have or have had tuberculosis. Several million of the children have two or more defects of body. Among the principal defects enumerated by Dr. Wood are the following:

From one to two per cent. or 400,000 have organic heart disease; probably five per cent. or 1,000,000 have tuberculosis of the lungs; about five per cent. or 1,000,000 have defective hearing; about twenty-five per cent. or 5,000,000 have defective vision; about twenty-five per cent. or 5,000,000 are suffering from malnutrition; about thirty per cent. or 6,000,000 have enlarged tonsils, adenoids or enlarged cervical glands; and about fifty per cent. or 10,000,000 have defective teeth which are interfering with health.

Against Patent Medicine Reading Notices.

One of the regulations adopted by the Post Office Department under the new law governing newspapers and magazines passed by the last congress, is of significance to the public health movement in that it should have the effect of indicating to the unsophisticated whether certain articles which they are reading concerning alleged "cures" are paid advertisements or simply plain reading matter. The regulation requires:

"That all editorial or other reading matter published in any newspaper, magazine, or periodical for the publication of which money or other valuable consideration is paid, accepted, or promised, shall be plainly marked 'advertisement.' Any editor or publisher printing editoral or other reading matter for which compensation is paid, accepted, or promised, without so marking the same, shall upon conviction in any court having jurisdiction, be fined not less than fifty dollars ($50) nor more than five hundred dollars ($500)."

The Lighting of Working Places.

"So much has been expended on securing the cleanliness, the efficient ventilation and a high standard of sanitary equipment in places in which workpeople are employed that the question of adequate lighting runs some risk of being overlooked. Yet it can hardly be disputed that a badly lighted workshop is very likely to be a dirty workshop, and that machinery accidents are less likely to occur where the lighting is not only good but is properly placed. Perhaps, when manufacturers can be convinced of the fact that more machinery accidents occur during the darker winter months of the year and during the latter part of the day than at other times, they will realise that it pays them to provide a sufficiency of light for their workpeople. In an instructive paper read before the International Congress for the prevention of accidents to workmen, held in Milan in May last, Mr. Leon Gaster discussed the value of good illumination as regards health and as a means of preventing accidents. After reviewing the different steps which had been taken in various countries with respect to improving the lighting of working places, he referred in terms of approval to the International Commission on Illumination which has been formed by the Illuminating Engineering Society of London. This Commission is to cover the whole field of illumination. It will deal not only with such questions as photometry, nomenclature, symbols, and the rating of illuminants, etc., but it will also have power to study more practical questions, such as the amount of illumination required in various industrial employments, and in dealing with such it will naturally avail itself of the conclusions reached by expert committees which have considered the hygienic aspects of lighting and which should have great weight in ensuring their being carried into effect in practice.

"Mr. Gaster suggests that factory inspectors should be instructed by the Governments in their respective countries to take particulars of the lighting conditions in the factories they visit as well as the condition of the health of the workers, in order that it may

be possible to trace what connection there is between these two conditions. In reporting, he says, on the illumination, inspectors should take note of obvious defects, such as the misplacing of lamps, the use of imperfectly shaded illuminants liable to be prejudicial to vision, and the neglect of adequate lighting for dangerous machinery, etc. In addition, he strongly urges that actual measurements of illumination should be made, as precise data of this kind form a most valuable supplement to personal impressions for future reference. He states that although not yet perfect, instruments for the measurement of illumination have been very much improved, and that the British Home Office have already accumulated a considerable amount of data of this description in various factories."

The Medical Officer, August 31, 1912.

International Congress Proceedings Summarized.

For the convenience of those who attended the International Congress on Hygiene and Demography and also for those who did not attend, the summary of the deliberations of this important gathering as issued by the Publicity Bureau of the Congress, should be of interest. The following theories, conclusions and opinions presented to the Congress are summarized by the Press Bureau. Although they are not in any sense a resumé of the Congress proceedings, they may focus attention on a few points of more popular interest.

The announcement of the discovery of several new micro-organisms including one which should prove of value in the prevention of the bubonic plague. This discovery was announced by Dr. Frederick Novy of the University of Michigan.

A contribution as to the method of infection of the sources of transmission of typhus fever and measles by Drs. Anderson and Goldberger of the United States Public Health Service.

Sir Thomas Oliver of England told the Congress that mine explosions could be reduced through the use of a new chemical which absorbed coal dust, the name of which he did not disclose.

Dr. M. J. Rosenau of Harvard University announced a discovery with regard to transmission of infantile paralysis through the bite of the oridnary stable fly.

Dr. John H. Long of Chicago—Benzoate of soda in food preparations is not harmful, despite the conclusions of Dr. Harvey W. Wiley.

Dr. A. J. Petersen of Sweden—Infantile paralysis is carried from person to person through the secretions of the nose.

Dr. S. Adolphus Knopf of New York—Fully 600,000 school children in the United States have traces of tuberculosis.

Dr. Frederick Zahn of Munich—There must be an economy of woman's energy if the nations of the world are to maintain the high standards set by the age.

Dr. Jacques Bertillon of Paris—Farmers are the most healthy class of humanity, and the liquor dealers the most sickly.

Dr. Lafayette Mendel of Yale—Dwarfs cannot grow, no matter how long the stunted condition has existed.

Dr. Charles V. Chapin of Providence, R. I.—Infection by the air is no longer the chief factor in the spread of infectious diseases.

Dr. C. C. Bliss of New Orleans—Malaria fever parasites can be produced artificially, thus opening the way for the prevention of malaria fever.

Dr. Walter Fornet of the German Army Medical College—Specific yellow fever parasites exist. (Dr. Fornet claimed to have discovered this parasite. American army officers disputed his contention.)

Dr. Francis M. McCrudden of the Rockefeller Institute—Bone is not dead tissue, but is constantly changing, and new bone is being constantly laid down.

Edward Burrell Phelps of New York—Infant mortality throughout the world is on the decrease, despite increased population and birth rate.

Dr. Herbert D. Pease of New York—Oysters in their raw state during non-hibernating periods are not carriers of contagious disease.

Dr. W. L. Moss of Johns Hopkins Uni-

versity—Inoculation of poisons known to be bacilli carriers is entirely impracticable.

Dr. William T. Sedgwick of the Massachusetts Institute of Technology—Contagious diseases are spread through the pollution of railroad beds; therefore there should be laws for regulating their use.

Dr. Charles Gilmore Kerley of New York—Heredity has nothing to do with the character of the child; it is the child's environment which is the determining factor in character building.

Dr. Yandell Henderson of Yale—Soap is the greatest civilizer of mankind.

Dr. L. E. Cofer of the United States Health Service—The Panama Canal will be a meeting place for yellow fever, plague, and contagious diseases from East and West, from North and South America, as well as from Asia.

Dr. John N. Hurty of Indianapolis—Rural communities eat too much fresh meat and bathtubs in farmhouses are as scarce as honest trusts.

Dr. Victor C. Vaughan of Ann Harbor—The non-poisonous tubercle bacillus is an effective vaccine for tuberculosis.

Bleecker Van Wagonen of New York—Ten per cent. of the entire population of the United States are inherently defective and unfit to be parents.

Dr. L. Pierce Clark of New York—Luxury, prosperity, and civilization are leading cases of degeneracy, and must correct themselves.

Dr. W. G. Eversole of Cleveland—Ninety-seven per cent. of public school children have diseased or defective mouths. Decay of the teeth is the most prevalent disease known to modern civilization.

Dr. L. Caozzi of Milan—The average span of life for printers is very low. The highest death rate among them is between the ages of 16 and 35.

Homicide on the Increase.

According to an article by Frederick L. Hoffman in the last number of *The Spectator*, the death rate from homicides in the principal American cities for the last 10 years exceeds that for any other decennial period and considerably exceeds also the death rate from this cause in England and Wales.

Mr. Hoffman's figures indicate a much greater prevalence of homicides in the South than in the North. For instance, as the following table shows, the rate per 100,000 population was 14.7 in southern cities as against 4.3 in eastern cities.

	1901-1910.		
Cities.	No. of Cities.	Homicides.	Rate per 100,000.
Eastern	11	3,260	4.3
Central	7	3,196	7.8
Southern	9	2,699	14.7
Western	3	517	9.7
All Cities	30	9,672	6.9

During the decade 1882–1891, the average death rate from homicides was 5.0 per 100,000 population; in the decade 1892 to 1901, it was 4.9; and in the decade 1902 to 1911 it had increased to 7.2. In the year 1910 and also in 1911, the rate was 8.3. The highest rate was 8.8, in 1907.

Memphis has the highest homicide death rate during the decade 1901 to 1910, the rate being 47.1 per 100,000 population. Charleston, S. C., comes next with a rate of 27.7; Savannah next with a rate of 25.6, and New Orleans next with a rate of 22.2. The lowest rate recorded by Mr. Hoffman was 1.7 in Milwaukee. The New York City rate was 5.1 and that from Brooklyn 4.2, as compared with 8.4 for Chicago.

Comparing American homicide records with those for England and Wales, Mr. Hoffman says:

"This comparison emphasizes the extremely high homicide rate prevailing in the United States at the present time. For males and females the average rate for England and Wales was 0.9 per 100,000 of population, against 4.3 for the registration area of the United States. In other words, there was an excess of 3.78 per cent. in the homicide mortality of the United States over the corresponding homicide record of England and Wales.

"Comparing males only, the rate for England and Wales was 0.9 per 100,000 of population, against 6.5 for the registration area of the United States. The American rate, therefore, was 6.22 per 100,000 in excess of the English rate. For females the English rate was exactly the same as for males, or

0.9 per 100,000 of population, whereas, for the registration area of the United States the female rate was 2.0 per 100,000 of female population.

"The comparison brings out in startling contrast the disregard of human life in the United States at the present time. The subject is obviously one of most serious importance, not only to life insurance companies, but also to the public at large, and, granting the defects in the available statistics, there can be no question of doubt but that the American homicide rate is exceedingly high, and that the rate is on the increase.

Transportation Inspection Plan.

According to recent press dispatches from Washington, the United States Public Health Service is planning to institute an inspection service of various railroads and terminals throughout the country. In order to accomplish this work with the least possible expense, it is planned to commission the various officers of the Public Health Service, when traveling under official orders on trains and vessels engaged in interstate commerce, to make inspections of the sanitary conditions of the trains and vessels on which they are traveling and also of stations, terminals, and wharves at which they stop.

It is intended that the representatives of the Public Health Service making these examinations shall report upon the conditions which they find, and that these reports will later be embodied in a printed statement to be issued in the usual manner. The plan of inspection has been made sufficiently broad so that it will include practically all phases of interstate passenger service.